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A Sector Assessment: Accelerating Growth of High-Speed Internet Services in Azerbaijan

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Executive Summary

Azerbaijan's development at the beginning of the XXI century is characterized by the great success story of its petroleum industry, which has propelled Azerbaijan to the level of the most rapidly growing economies in Europe and Central Asia.

While oil and gas reserves are finite and their extraction and transportation is largely impacted by exogenous factors the Government of Azerbaijan has recently focused its policies on economic diversification, which, among others, prioritizes public investment spending to boost the information and communication technologies (ICT) sector. It is envisaged that by 2020 Azerbaijan's ICT sector should become one of the main contributors to the non-oil GDP and should facilitate country's transition into the knowledge economy.

Telecommunications liberalisation, modernization and extension of the national telecom infrastructure, implementation of e-government, and other sector-specific policies have helped stimulate the growth of the local ICT sector which since 2005 has been expanding at an average rate of 25-30%. The telecom industry, especially its mobile segment, has fueled the overall ICT sector development. The number of Internet users has soared from only 17% in 2008 to 73% in 2013. By 2014, the wireless penetration per capita grew at over 100%, around one third of the population gained mobile broadband access, and 30% of Azerbaijan's households subscribed to fixed (wired) broadband Internet.

Gradual extension of mobile and fixed broadband networks, coupled with significant reduction in broadband access wholesale and retail prices for country's Internet service providers (ISPs) and customers, has resulted in increasing penetration growth and improving affordability performance. When compared to Central Asian peers, Azerbaijan boasts the lowest prices for fixed and mobile broadband access in proportion to the average disposable monthly income. Yet, the quality of broadband service is strikingly low: the number of higher speed connections (over 4Mbps) is persistently lower than 10% of all connections in the country, with a very slow increase over the last two years. Prevalence of low speed broadband connections holds back arrival of socioeconomic benefits associated with higher speed broadband rollout, including, but not limited to, online job creation, human skills development, attraction of FDI, etc.

The analysis performed in this sector assessment has established that the countries which facilitate infrastructure-based and technology neutral competition perform exceptionally well in terms of the fixed and wireless penetration while enjoying high quality of service at low and affordable prices (eg. Lithuania, Norway). Infrastructure-based competition is usually fostered through regulatory approaches which encourage the market players to invest in national backbone infrastructure through the use of bitstream and invest in regional infrastructure through the local loop unbundling. The top performing countries in the benchmark sample have transposed EU telecom regulatory framework and are marked by regulatory independence and separation between broadband strategy formulation and implementation.

Due to the absence of the level-playing field between state-owned incumbents and alternative operators Azerbaijan's ISPs do not seem to be sufficiently incentivized to develop their own access fixed networks through regulatory means and therefore increase the quality of their service provision. Regulatory bottlenecks at the wholesale level and low fixed broadband infrastructure coverage outside of Baku further impede private sector deployment of the access networks. The MCHT is responsible for establishing and enforcing the state policy of electronic communications acting both as a policymaking and regulatory body. The Ministry also formulates proposals on the provision of public investments into the sector while the sector itself is dominated by two state-

owned enterprises. The main challenge arising from this conflict of interest is to sustain healthy competition and private investment inflow in the long run.

Given the strong leverage the Government of Azerbaijan has over the telecom sector, which is a backbone of the ICT sector, it is highly recommended that Azerbaijan policymakers act on their country's broadband potential through enactment of sector governance reform and adoption of measures stimulating infrastructure-based competition, specifically in the fixed broadband market. Such a "recipe" will ensure long-term sustainability of the sector growth as well as achievement of the state diversification goals aimed at non-oil GDP development.

I. Introduction

1. **Today Azerbaijan relies on the energy sector for 92% of its exports, 42% of GDP, and 70% of the budget revenues.**¹ Recognizing the need to reduce the country's dependence on hydrocarbon exports, the Government of Azerbaijan has adopted a long-term diversification plan focused on non-oil industry development. The plan foresees introduction of second generation regulatory reforms and economic incentives aimed at developing non-oil sectors, such as ICT. A strong ICT infrastructure base is a prerequisite for the diversification of a country, as it creates opportunities to leapfrog through strengthening country's physical capital, fuelling acceleration of growth, and reducing income disparities. ICTs facilitate increase in labour productivity, economic growth and profitability in organizations across all sectors.
2. In addition to other priorities, one of the main targets of „Azerbaijan 2020 – Vision for Future“ Development Concept is to double non-oil sector GDP in coming 8-10 years by using ICT.² **Significant public investment in ICT infrastructure is expected to accelerate development of the ICT sector and grow its share in the non-oil GDP, which currently stands at 4.74%.**³ In 2005-2012, ICT sector grew at a rate of 25-30% per annum reflecting the overall faster growth of the economy and regulatory reforms, which liberalized the market.⁴ As part of this agenda, the government has developed a National Broadband Development (FTTH) Plan on deploying broadband networks over fibre optic cables in the country's un- and under-served rural areas at a cost of over US\$550mln for the period of 2014-2016. The government intends to proceed with implementation of the FTTH Plan in the near future.
3. **By developing appropriate policies aimed at accelerating broadband diffusion, countries can increase domestic competitiveness and the likelihood of sustained economic growth.** Over the last few years, there was a notable burst of studies analysing the contribution of broadband Internet to GDP growth (World Bank,⁵ ITU,⁶ OECD, McKinsey,⁷ and others⁸). In spite of some contrarian views, the evidence is fairly conclusive – broadband has a positive impact on GDP growth.⁹
4. **This note analyses development of the broadband¹⁰ Internet market in Azerbaijan and preconditions for its sustainable positive growth.** The note starts with a brief overview of the

¹ Statistical Committee of the Republic of Azerbaijan (AzSTAT), 2013, <http://www.stat.gov.az/>.

² Ali Abbasov, “Speech of Minister Ali Abbasov at 17th Eurasian Economic Forum,” *ICT News*, February 16, 2014, <http://www.ictnews.az/read-28977-news-2.html>.

³ Note: the amount of nominal non-oil GDP for 2012 is preliminary. International Monetary Fund (IMF), “Republic of Azerbaijan - Aide Memoire of Staff Visit,” November 15, 2013, <https://www.imf.org/external/np/ms/2013/111513.htm>.

⁴ AzSTAT, “ICT Sector and Core Indicators on Trade of ICT Goods,” 2013, <http://www.stat.gov.az/source/communication/indexen.php>.

⁵ C. Z. Qiang and C. M. Rossotto, *Economic Impacts of Broadband* (Washington, D.C.: World Bank, 2009).

⁶ R. Katz, *Impact of Broadband on Economy* (ITU, 2012), http://www.itu.int/ITU-D/treg/broadband/ITU-BB-Reports_Impact-of-Broadband-on-the-Economy.pdf.

⁷ McKinsey & Company, “Mobile Broadband for the Masses,” February 2009, http://www.mckinsey.com/client-service/telecommunications/mobile_broadband.asp.

⁸ N. Czernich, et al., *Broadband Infrastructure and Economic Growth* (2009), www.ifo.de/DocCIDL/cesifo1_wp2861.pdf.

⁹ Charles Kenny, “No Need for Speed,” *Foreign Policy*, 2011, available at http://www.foreignpolicy.com/articles/2011/05/16/no_need_for_speed.

¹⁰ The commonly accepted definition of bandwidth rates for broadband, according to the International Telecommunications Union (ITU), is at least 256 Kbps. This definition of broadband (“always on,” download speed rates higher than 256 Kbps) will be used throughout this paper. Source: ITU, *Core ICT Indicators* (Geneva, Switzerland: 2010); ITU, “Partnership on Measuring ICT4D,” available at http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-ICT_CORE-2010-PDF-E.pdf; ITU, *Telecommunication Indicators Handbook* (Geneva, Switzerland: ITU, 2011), http://www.itu.int/dms_pub/itu-d/opb/ind/D-IND-ITC_IND_HBK-2011-PDF-E.pdf.

relevant economic developments and performance of the ICT sector within economy. In Section III, Azerbaijan's broadband market performance is benchmarked against peers in Central Asia, Europe, and the Gulf. The benchmarking exercise elucidates impediments to the broadband access adoption in Azerbaijan on the supply side of the broadband market value chain relating to the peculiar local market structure, level of domestic competition, governance model, and affordability and availability of the services for the country's poorest. While there are many factors influencing broadband market development, including taxation and trade policy in telecom and IT as well as user demand, among others, this assessment focuses primarily on the supply side bottlenecks. The note ends with a set of recommendations on how to accelerate performance of Azerbaijan's broadband market and sustain its positive trajectory in the long run.

II. Economic Profile and Development of ICT Sector

5. **The Government of Azerbaijan has placed a high emphasis on economic diversification realizing that reliance on the energy sector alone is not sustainable in the long term.** Today Azerbaijan relies on the energy sector for 92% of its exports, 42% of GDP, and 70% of the budget revenues.¹¹ In 2013, the State Oil Fund of Azerbaijan (SOFAZ) used 83.5% of its revenues to subsidize the state budget.¹²
6. Fostered by significant amount of public spending, especially in construction, the share of the non-oil sector in GDP and non-oil exports has been steadily growing over the recent years. However, with declining oil production and lack of other sustainable sources of government revenue, non-oil sector growth could be quickly curtailed.¹³ The country has become increasingly dependent on its annual energy revenues as a trigger for the non-oil sector growth.¹⁴
7. Oil wealth allowed Azerbaijan to rapidly propel to the level of upper middle income countries.¹⁵ **In 2012, Azerbaijan's GNI per capita reached US\$6,220 nearing the average of upper middle income group estimated at US\$6,968,** yielding only to Kazakhstan among comparators in Central Asia (Figure 1).¹⁶
8. **According to World Bank's ECA poverty estimates (ECAPOV), Azerbaijan achieved an impressive 47% drop in the ratio of moderately poor (vulnerable) population in 2005-2008,¹⁷ which led to strengthening of the country's middle class.** This result may be attributed to a strong performance of social welfare transfers and implementation of the government plan on socioeconomic development of the regions.

¹¹ See supra note 1.

¹² State Oil Fund of the Republic of Azerbaijan (SOFAZ), "SOFAZ 2013 Budget," http://www.oilfund.az/en_US/hesabat-arxivi/rubluh/2013_1/2013_1_4/.

¹³ World Bank, "Challenges Posed By Declining Oil Production," Azerbaijan Economic Report No. 3, April 2013, 4, <http://intresources.worldbank.org/INTECASUMECSP/ECSP1AZE.pdf>.

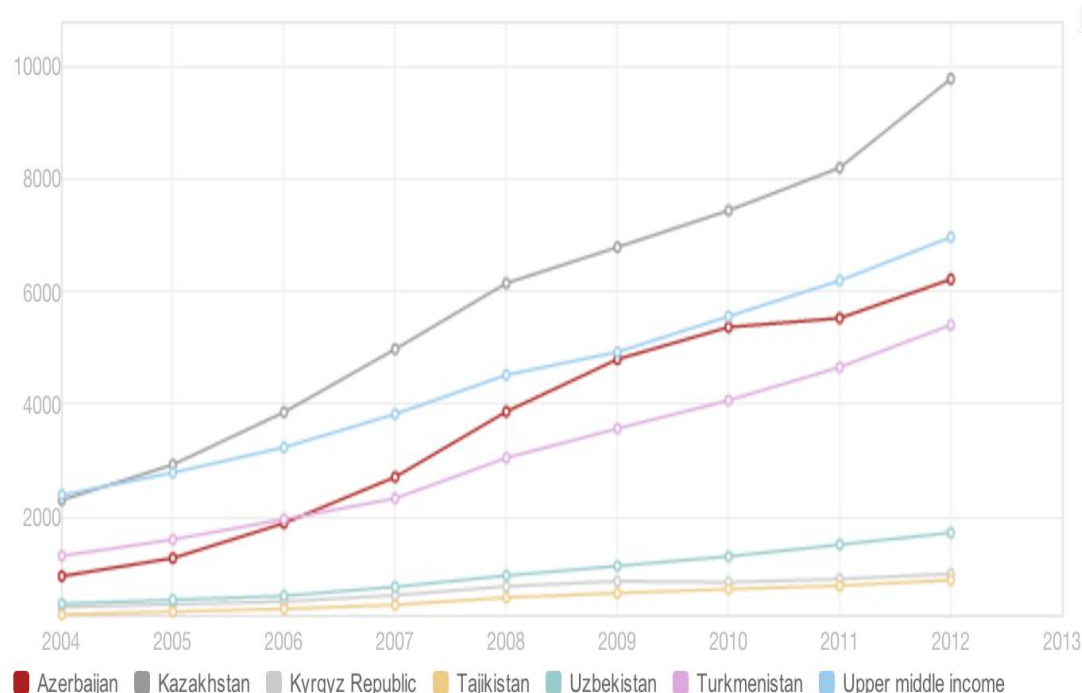
¹⁴ See Table 6 "Consolidated Budget Expenditure" and Table 7 "Consolidated Budget Revenues" in World Bank, "Challenges Posed By Declining Oil Production," 11.

¹⁵ World Bank Data, World Development Indicators, "Upper Middle Income, 2012," <http://data.worldbank.org/income-level/UMC>.

¹⁶ World Bank Data, World Development Indicators "GNI per Capita, Atlas Method (Current US\$), 2012."

¹⁷ The share of the population living for less than US\$5 a day corresponds with the value of a moderate poverty line. World Bank's ECA Poverty Analytics Tool (ECAPOV) provides international comparison of poverty in ECA countries. See: World Bank, "International Poverty Rates for ECA Countries," ECAPOV, 2002-2008.

Figure 1: GNI per capita, Atlas method (current US\$): Azerbaijan v. upper middle income group average and benchmark countries in Central Asia



Source: World Bank Data, World Development Indicators

9. Extreme poverty, which fell from 11.5% in 2002 to 5.3% in 2013, concentrates mostly in urban areas.¹⁸ Similar to an average upper middle income country, but unlike the majority of comparators in Central Asia, more than a half of Azerbaijan's population lives in the cities (54% of the population, or over 5 million inhabitants). Moreover, 40% of urban population resides in a single metropolitan area – the City of Baku.¹⁹ In addition to Baku (6.6% of poverty headcount rate), Lankaran (5.1%) and Yukhari Qarabag (5.2%)²⁰ are two regions with a high share of the poor in the local socioeconomic structure.²¹
10. Since 2005, ICT sector of Azerbaijan has experienced stable positive growth at an average growth rate of 25-30%, attributed to a number of reasons, including, among others, introduction of telecom licensing reforms, implementation of three state programs on development of ICTs that promoted ISP sector liberalization, modernization of national telecom infrastructure, and stimulation of end user demand for ICTs. In 2013, the number of Internet users has soared to 73% from 17% in 2008, and the number of those who have used computers has reached 62% from 24.9% in the baseline year²². Increased individual usage of Internet has been reflected in Azerbaijan's ranking internationally (Figure 3).

¹⁸ ECAPOV estimated that \$2.5 a day constitutes the extreme poverty limit for households in the ECA region. In 2008, 5.4% of the very poor people were urban dwellers and 3.4 % of the very poor people lived in rural areas. Ibid.

¹⁹ World Bank Data, World Development Indicators, "Population in the Largest City (% of Urban Population), 2012," <http://data.worldbank.org/indicator/EN.URB.LCTY.UR.ZS/countries>.

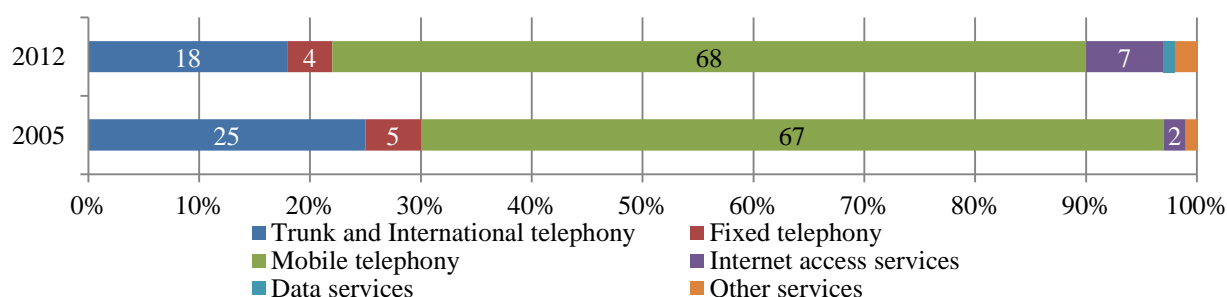
²⁰ Yukhari Qarabag is not controlled by the central government and is administered by a self-proclaimed regime.

²¹ AzSTAT, Labor Market, "Economic Regions: Average Monthly Nominal Wages and Salaries of Employees by Economic Region," <http://www.stat.gov.az/source/labour/indexen.php>. World Bank, ECAPOV, "Azerbaijan Poverty, 2001-2008: Table 2.2.," "Poverty by Geographic Regions, 2008," and "Azerbaijan Poverty Map, 2008."

²² State Statistical Committee of the Republic of Azerbaijan. *Information & Communication Technology Statistical Yearbook [ENG]*. 2014. http://www.stat.gov.az/source/information_society/indexen.php.

11. The sector growth is characterized by increasing involvement of the private sector whose share of the overall ICT market has reached 80% in 2011, increasing from 67.3% in 2003.²³ In the telecom sector, mobile operators are private companies, while the largest fixed broadband providers remain under the state ownership. A total of over US\$3 billion was invested in the telecom sector in 2002-2013, and a quarter of this amount came from foreign investors in 2005-2012.²⁴ The greatest portion of the investment was allocated for mobile network infrastructure.
12. In 2013, income of information and communication services in real prices peaked at AZN1,528mln or ~US\$1,960mln²⁵, out of which the revenues of telecommunication services (e.g. mobile telephony, trunk and international telephony, broadband Internet, etc.) roughly accounted for 88% of the total income (Figure 2). Over the last two decades, communication services, as a whole, have generated over 90% of general ICT service industry revenues, with the culmination at 96% in 2007. Since 2008, the income of broadband Internet services has been slowly moving upward and in 2012 it for the first time forged ahead of landline telephony, generating 7% of income as a share of total telecom services.²⁶

Figure 2: Share of revenues per communications service in Azerbaijan in 2005 and 2012



Note: Telegraph communication has not been taken into account as its income share over the years has been far below 1%.

Source: AzSTAT

13. Azerbaijan's ICT sector development is reflected in the World Economic Forum (WEF) Global Information Technology rankings: slightly lagging behind Kazakhstan, the country is demonstrating second highest ICT performance among the Commonwealth of Independent States (CIS). In 2012, the country moved nine positions up WEF's Network Readiness Index, five positions up in 2013, and seven positions up in 2014, thus reaching the 49th rank among 148 countries globally.²⁷ Over the last years, the country has shown overall progress on nearly all sub-indexes, with the highest positive change in value ranking occurring on infrastructure and digital content, and on individual ICT usage. Azerbaijan has been performing best on the Affordability sub-index (40th rank globally), even though the ranking has slightly decreased from 2013. On the rest of the pillars, Azerbaijan shows lower performance, with economic impacts of ICT being the weakest link of the chain.

²³ R. Aliguliyev and G. Gurbanov, "Big Ambitions in Rapidly Changing World: Azerbaijan," *World Economic Forum*, 2012.

²⁴ V. Zhavoronkova, "Action Plan on Broadband Internet Development in Azerbaijan Meets ITU Requirements," *Trend*, May 10, 2012, <http://en.trend.az/capital/it/2024414.html>. Note: Aliguliyev and Gurbanov (2012) give a similar account of investment dynamics, except for they refer to ICT-related investments of around US\$2bln in 2004-2011 and NOT telecom investments.

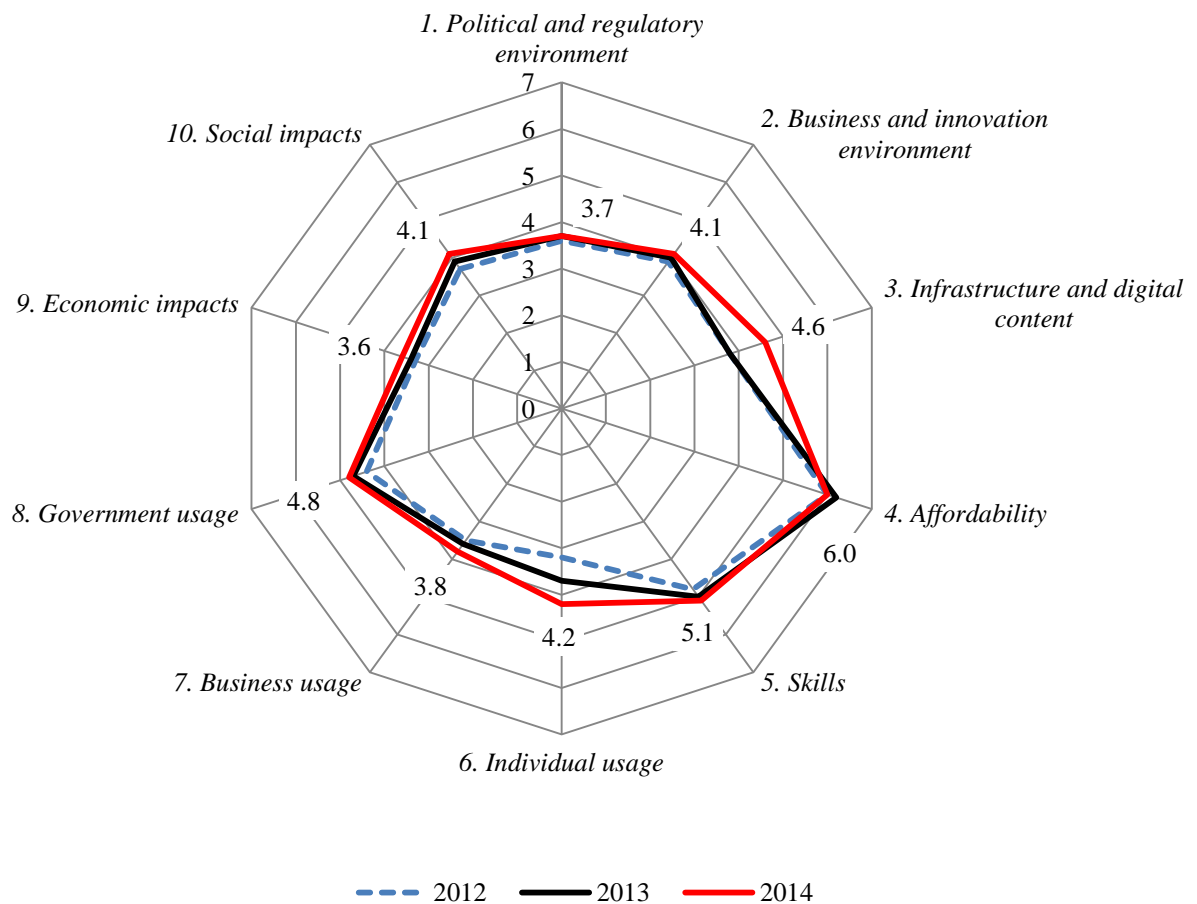
²⁵ US\$1 = 0.78AZN, according to Official Exchange Rate 2013 (LCU per US\$, period average)

<http://data.worldbank.org/indicator/PA.NUS.FCRF>

²⁶ AzSTAT, "Income Information and Communication Services, 2012" <http://www.stat.gov.az/source/industry/indexen.php>.

²⁷ WEF. "The Global Information Technology Report," 2012, 2013, and 2014, <http://www.weforum.org/reports>.

Figure 3: Azerbaijan's ICT performance, Network Readiness Index 2012-2014



Source: WEF, 2014²⁸

14. Throughout this sector assessment Azerbaijan is benchmarked against Central Asian countries, oil-exporting economies (Qatar, United Arab Emirates, and Norway) as well as select European countries (Lithuania, Turkey, and Norway) on different aspects of broadband market development. The choice of the benchmark countries is deliberate: Azerbaijan is juxtaposed to the comparators which share common Soviet legacy and ensuing development challenges (Central Asia and, to a lesser extent, Lithuania), similar geography and oil exporting structure of the economy (United Arab Emirates, Qatar, and, to a lesser extent, Norway), and those countries that have successfully applied European regulatory framework to boast penetration of broadband services through creation of competitive environment and could serve as role models for Azerbaijani policymakers (Lithuania, Turkey, and Norway). While the choice of Central Asian and Gulf countries may be intuitively explained, the choice of Lithuania, Turkey, and Norway needs additional explanation.

²⁸ See supra note 27.

- 15.** Both Lithuania and Azerbaijan started their telecom market development in the early 1990s after gaining independence from the Soviet Union. Over the years, Lithuania has been harmonizing its telecom regulatory framework in accordance with EU Directives thus promoting infrastructure-based competition. Since 2009 Lithuania is a leader of European rankings for FTTx penetration and is a good role model in terms of regulatory achievements.²⁹ Unlike Lithuania, Turkey and Norway are not members of the European Union however both are implementing European regulatory framework driven by the intention to create a level-playing field for all technologies and operators. Adherence to the EU telecom regulatory framework resulted in good market developments in both countries: Norway, for example, boasts one of the lowest broadband prices and highest penetration rates for both fixed and mobile broadband services.

²⁹ Fibre to the Home (FTTH) Council Europe, <http://www.ftthcouncil.eu/>.

III. Affordability and Availability of Broadband Internet Access Services

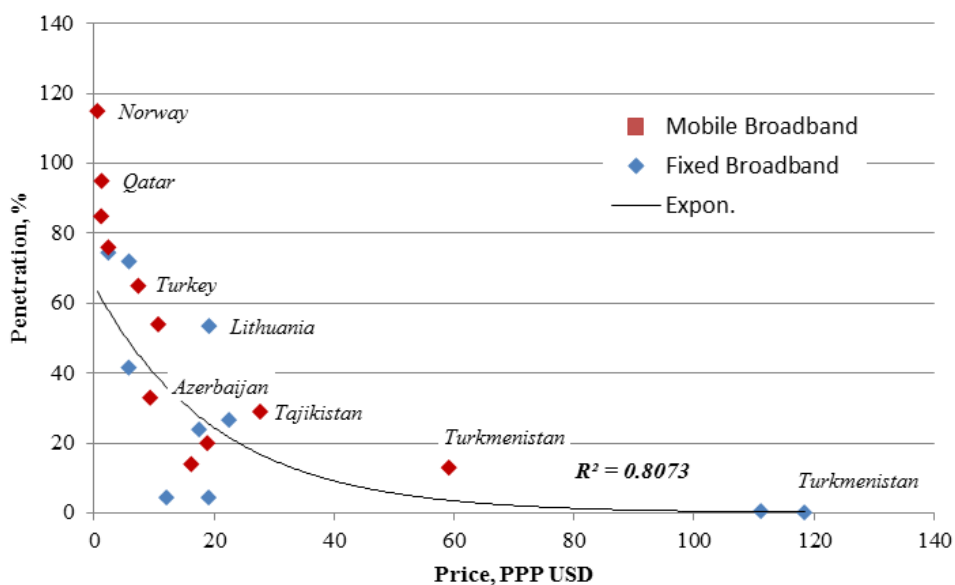
3.1. Analysis of the affordability of broadband services

- 16. The price of broadband services plays a critical role in fostering broadband diffusion.** According to ITU, broadband penetration grows rapidly after the level of retail broadband price falls below 3–5% of average monthly income.³⁰ The correlation between the price of broadband packages and fixed and mobile broadband penetration could be well observed on a sample of select benchmark countries (Figure 4).
- 17. Azerbaijan and Kazakhstan have made a particularly remarkable progress in bringing down the cost of the fixed broadband services: in the case of Azerbaijan, the decrease in prices throughout 2009-2012 was 13 times.**³¹ (Figure 5) Average prices for mobile broadband became more affordable, too, and consequently, both fixed and mobile broadband prices in the country are currently the lowest in Central Asia (Table 1). The price of the cheapest average fixed broadband package with the connection speed of 1Mbps accounts for 13.82% of the average disposable monthly income and the price of the similar mobile broadband package stands at 10.36% of the average disposable monthly income. Experience of the European countries which have facilitated infrastructure-based competition proves that the level of prices could be much lower, e.g. Norway or Lithuania. Further analysis shows that the level of broadband prices is lower when the market concentration is lower (See Figure 9c).

³⁰ International Telecommunication Union (ITU), Broadband Commission for Digital Development, “Broadband Targets for 2015,” http://www.broadbandcommission.org/Documents/Broadband_Targets.pdf.

³¹ Ulkar Sadigova, “Current Situation in Telecom Regulation,” [Online Presentation], Department on Regulation, Ministry of Information and Communication Technologies of the Republic of Azerbaijan, April 23, 2013.

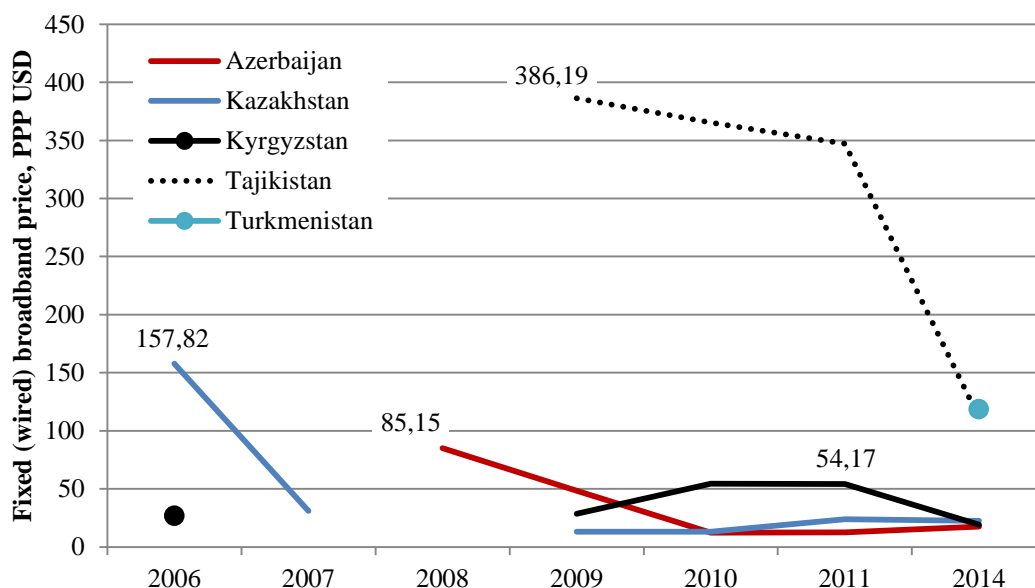
Figure 4: Prices and penetration of fixed and mobile broadband in Azerbaijan v. select benchmark countries, 2014



Note: Prices for mobile broadband in Uzbekistan are not available.

Source: World Bank analysis³²

Figure 5: Fixed (wired) broadband price evolution in Azerbaijan v. select Central Asia countries, 2006-2014



Note: Prices for mobile broadband in Uzbekistan are not available.

Source: World Bank analysis³³

³² TeleGeography, "Broadband," 2014, <http://www.TeleGeography.com/products/globalcomms/data/country-profiles/ee/azerbaijan/broadband.html>. TeleGeography, "Wireless," 2014, <http://www.telegeography.com/products/globalcomms/data/country-profiles/ee/azerbaijan/wireless.html>. For prices – see Table 1, Notes.

³³ Ibid.

Table 1: Comparison of the cheapest fixed and mobile broadband offerings on the market in Azerbaijan and select Central Asian countries, April 2014

Country	Fixed broadband price, PPP	Mobile broadband price, PPP	Average monthly disposable income, PPP	Fixed broadband price as % of average disposable monthly income, %	Mobile broadband price as % of average disposable monthly income, %
Azerbaijan	27.78	20.83	201.06	13.82	10.36
Kazakhstan	23.37	36.26	196.33	11.9	18.47
Kyrgyz Rep.	30.74	18.41	116.34	26.42	15.82
Tajikistan	72.77	46.60	99.56	73.10	46.80
Turkmenistan	144.10	71.9	83.52	172.54	86.08
Lithuania	19.17	10.69	445.83	4.3	2.4
Norway	34.13	11.30	4,430.24	0.77	0.26
Turkey	33.98	27.79	286.57	11	9
Qatar	120.97	26.21	7,146.12	1.69	0.37
United Arab Emirates	75.38	56.63	3,196.30	2.36	1.77

Note: Fixed and mobile broadband prices are shown as a percentage of the average disposable monthly income per capita; World Bank Data, World Development Indicators: Population (Total),³⁴ PovcalNet (1998 – 2011),³⁵ TeleGeography Globalcomms Database 2013,³⁶ official websites of the national telecom operators with the market share of over 30% for fixed operators and 20% for mobile operators. Norway's average monthly income figure is based on EU SILC microdata,³⁷ Qatar's – on data provided by the Ministry of Development Planning and Statistics of Qatar,³⁸ and United Arab Emirates' – on data provided by country's National Bureau of Statistics.³⁹ The simple average of the lowest-priced fixed and mobile broadband packages per country has been calculated excluding any discounts and special offers and including taxes. Uzbekistan's fixed and mobile broadband prices as a percentage of the average disposable monthly income could not be calculated due to unavailability of valid PPP available (see PovcalNet). **The 2012 PPP Conversion Factor, GDP (LCU per international \$)⁴⁰ per each country has been applied to the prices in local currency. The consumption data from PovcalNet, upon which this analysis is based, may have certain inaccuracies.**

Source: World Bank analysis

³⁴ World Bank Data, World Development Indicators, "Population (Total)," 2009-2013, <http://data.worldbank.org/indicator/SP.POP.TOTL>.

³⁵ PovCalNet: the online tool for poverty measurement developed by World Bank's Development Research Group. For more information see: <http://iresearch.worldbank.org/PovcalNet/index.htm>.

³⁶ See supra note 32

³⁷ European Commission, Eurostat, "European Union Statistics on Income and Living Conditions," accessed on June 24, 2013, http://epp.eurostat.ec.europa.eu/portal/page/portal/microdata/eu_silc.

³⁸ Ministry of Development Planning and Statistics of Qatar, "Household Expenditure and Income Sample Survey, 2006-2007," 17, accessed on June 24, 2014, http://www.qix.gov.qa/portal/page/portal/QIXPOC/Documents/QIX%20Knowledge%20Base/Publication/Population%20Statistics/Household%20survey/Source_QSA/Household_Expenditure_Income_Survey_QSA_Bu_AE_2007.pdf.

³⁹ National Bureau of Statistics of the United Arab Emirates, "Operating Surplus and National Disposable Income," accessed on June 24, 2014, <http://www.uaestatistics.gov.ae/EnglishHome/ReportDetailsEnglish/tabid/121/Default.aspx?ItemId=2253&PTID=104&MenuId=1>.

⁴⁰ World Bank Data, World Development Indicators, "PPP Conversion Factor, GDP (LCU per International \$)," 2012, <http://data.worldbank.org/indicator/PA.NUS.PPP>.

18. Further scrutiny reveals that a representative of the poorest average household in Azerbaijan (lowest 40% of the total population by income) needs to allocate 20.64% of his/her monthly disposable income to afford the cheapest mobile broadband package and 27.52% of the monthly disposable income – for the cheapest fixed broadband package. A member of the moderately poor household (lowest 60% of the total population by income) needs to pay 17.16% and 22.87% for the cheapest mobile and fixed broadband package, respectively (Table 2).

Table 2: Fixed and mobile broadband price as % of monthly income, June 2014

Service / Providers	Price as % of disposable monthly income, %	Price as % of disposable monthly income for the lowest 40% of the population, %	Price as % of disposable monthly income for the lowest 60% of the population, %
Fixed broadband: simple average of the single cheapest offer of two largest operators Aztelecom and BakTelekom	13.82	27.52	22.87
Mobile broadband: simple average of the single cheapest offer of three largest operators Azercell, Bakcell, and Azerfon	10.36	20.64	17.16

Note: PovcalNet (2008),⁴¹ World Development Indicators: Population (Total),⁴² official websites of the telecom operators. The lowest-priced fixed and mobile broadband packages by the operators with the largest market share were selected and the simple average of the single lowest-priced offering per provider has been calculated. The lowest-priced fixed or mobile broadband packages selected do not include any discount or promotional offers.⁴³ The PPP Conversion Factor, GDP (LCU per international \$)⁴⁴ has been applied to prices in the local currency. The consumption data, upon which this affordability analysis is based, may have certain inaccuracies.

Source: World Bank analysis

19. Differences in the wages across the country are significant because they have impact on the purchasing power of the population. In addition, low population density across some of the regions impacts viability of the business case for the network operators. For the inhabitants of the regions with lower wages, broadband services are less affordable and broadband take-up in these regions is subsequently more hindered, as opposed to the regions with higher incomes. For example, an average household located in the poorest regions of the country - Yukhari Garabagh and Daghlig Shirvan - annually makes AZN2,691.6 or US\$3,450.77 and AZN2,767.2 or US\$3547.69, correspondingly, which constitutes between 40% and 41% of what an average household in Baku earns per annum. Lowering broadband Internet offering rates can have an immediate positive impact on fixed broadband penetration in Absheron and Lankaran, Azerbaijan's most highly populated regions where an employee's

⁴¹ See supra note 35.

⁴² See supra note 34.

⁴³ The lowest-priced packages chosen are: (i) ADSL 1024 Kbps packages by Aztelecom and BakInternet and (ii) 4Gb, 3Gb, and 1Gb mobile broadband packages by Azercell, Bakcell, and Azerfon, correspondingly.

⁴⁴ See supra note 40.

average annual income is 52% and 56% lower than of identical employee in Baku (Figure 6).⁴⁵ Inequality in the context of broadband affordability additionally reveals itself in the uneven distribution of personal computers/laptops among households depending on the average income of a household. According to AzSTAT survey conducted in 2013, only 5.4% of households with monthly income under AZN200 or ~US\$256 and 39.8% of households with monthly income of AZN200-399 or ~US\$256-512. could afford a computer.⁴⁶

Figure 6: Average monthly nominal wages and population density by economic regions, 2012



Note: Wages in \$ are shown according to the Official Exchange Rate (LCU per US\$, Period Average, World Bank Data).⁴⁷ The map is retrieved from World Bank Cartographic Services.

Source: AzSTAT⁴⁸

20. With MCHT's support the State Statistical Committee of Azerbaijan conducts annual surveys measuring the level of ICT application and identifying issues related to its development. According to the 2013 survey, high computer prices were listed among the main reasons that hinder usage of Internet across the country: for 38.8% of the survey respondents a high computer price constitutes an issue. By contrast, only 7.0% of those

⁴⁵ Azərbaycan Respublikasının Dövlət Statistika Komitəsi (AzSTAT), "Azərbaycanda İnformasiya Cəmiyyəti: İnformasiya və Kommunikasiya Texnologiyaları. Statistika Məcmua, 2013," (Information Society in Azerbaijan: Information and Communication Technologies. Statistical Booklet, 2013) (Baku: AZSTAT, 2013), table 3.14, 37.

⁴⁶ See supra note 22

⁴⁷ See supra note 25.

⁴⁸ See supra note 45

interviewed attribute their low Internet usage to the high broadband service price.⁴⁹ When compared internationally, 53.2% of households in Azerbaijan own a computer and 71.6% of households have Internet access at home,⁵⁰ whereas in the developed countries 75.5% of households have a computer and 77.7% of households have Internet access at home.⁵¹ The higher share of Internet users over computer users may attest to the fact that there is rapid mobile broadband take-up even among those who cannot afford computer devices, which is supported by the findings that around 29% of all households are connected to the Internet via mobile phone connection,⁵² the cheapest mobile broadband packages are more affordable than the fixed ones, and that deployment of fixed broadband networks is mostly limited to the urban areas.

- 21. Affordability of the broadband Internet access appears to be among the factors withholding broadband uptake in the regions of Azerbaijan with lower living standards.** In contrast, broadband Internet access is considered fairly affordable in the wealthier parts of the country thanks to increasing income levels that drive spending on Internet connectivity and devices. Development impediments are additionally influenced by low understanding of the value of broadband Internet and its value-added services (e.g., online payments, consolidated billing, content delivery, and messaging) as well as by limited broadband coverage outside the major cities and high computer prices for the part of population with lower income.

⁴⁹ AzSTAT, “Reasons of Unavailability of home Internet Access, as % of total,”

http://www.stat.gov.az/source/information_society/indexen.php.

⁵⁰ AzSTAT, “Core Indicators on ICT Systems and Use in Households,”

http://www.stat.gov.az/source/information_society/indexen.php.

⁵¹ ITU, “Key ICT Indicators for Developed and Developing Countries and the World,” http://www.itu.int/en/ITU-D/Statistics/Documents/statistics/2013/ITU_Key_2005-2013_ICT_data.xls.

⁵² AzSTAT, “Internet Access of Households [2013],” http://www.stat.gov.az/source/information_society/indexen.php.

3.2. Analysis of availability and quality of the broadband Services

3.2.1. Characteristics of supply of the fixed broadband services

- 22. Licensing Reform implemented in 2002 lowered administrative barriers to enter the telecom market, for instance, licensing of Internet services was cancelled, basically allowing any entity to become an ISP.**⁵³ There are some 40 ISPs operating in the market,⁵⁴ the majority of them are privately-owned companies (Table 3).⁵⁵ State-owned Aztelekom and Baku Telephone Production Association (BTRIB) together control over 56% of the market share (subscribers); private ISPs serve the remaining part of the market (Figure 9). The market base for Aztelekom and BTRIB is split along geographical lines: the former serves Azerbaijani regions, whereas the latter operates in the capital⁵⁶.
- 23. MCHT-led sharp reduction in retail broadband access tariffs since 2008 stimulated subscriber service uptake the annual growth of which peaked at 162.5% in 2010.** Decrease of retail prices catalyzed the market's recent growth which was further strengthened in 2011 when national backbone operator Delta Telecom made a decision to reduce the cost of leasing international channels. At the end of 2013, the number of fixed broadband subscribers in Azerbaijan was 605,233 translating to 30.26% household penetration – the highest penetration in Central Asia. Household broadband penetration in Azerbaijan is, however, substantially lower than in benchmark countries, e.g. two times lower than in Lithuania, three times lower than in Qatar or the United Arab Emirates, and four times lower than in Norway⁵⁷ (Figure 7).

Table 3: Azerbaijan's biggest fixed broadband operators, access technologies and ownership, 2013

Operator	Technology				Ownership*
	xDSL	FTTx	Cable	WiMax	
Aztelecom	+	+			Public 100%
Baku Telephone Production Association (BTRIB)	+	+			Public 100%
UniNet	+				Private 100%
Azeronline	+	+			Private 100%
ULTEL MMC	+				Private 100%
Delta Telecom				+	Private 100%

Note: * In accordance with the national laws information on the ownership is treated as confidential.

Source: Publicly available information, TeleGeography GlobalComms Database, <http://www.telegeography.com>

Figure 7: Growth of fixed broadband penetration in Azerbaijan v. benchmark countries, 2008-2013

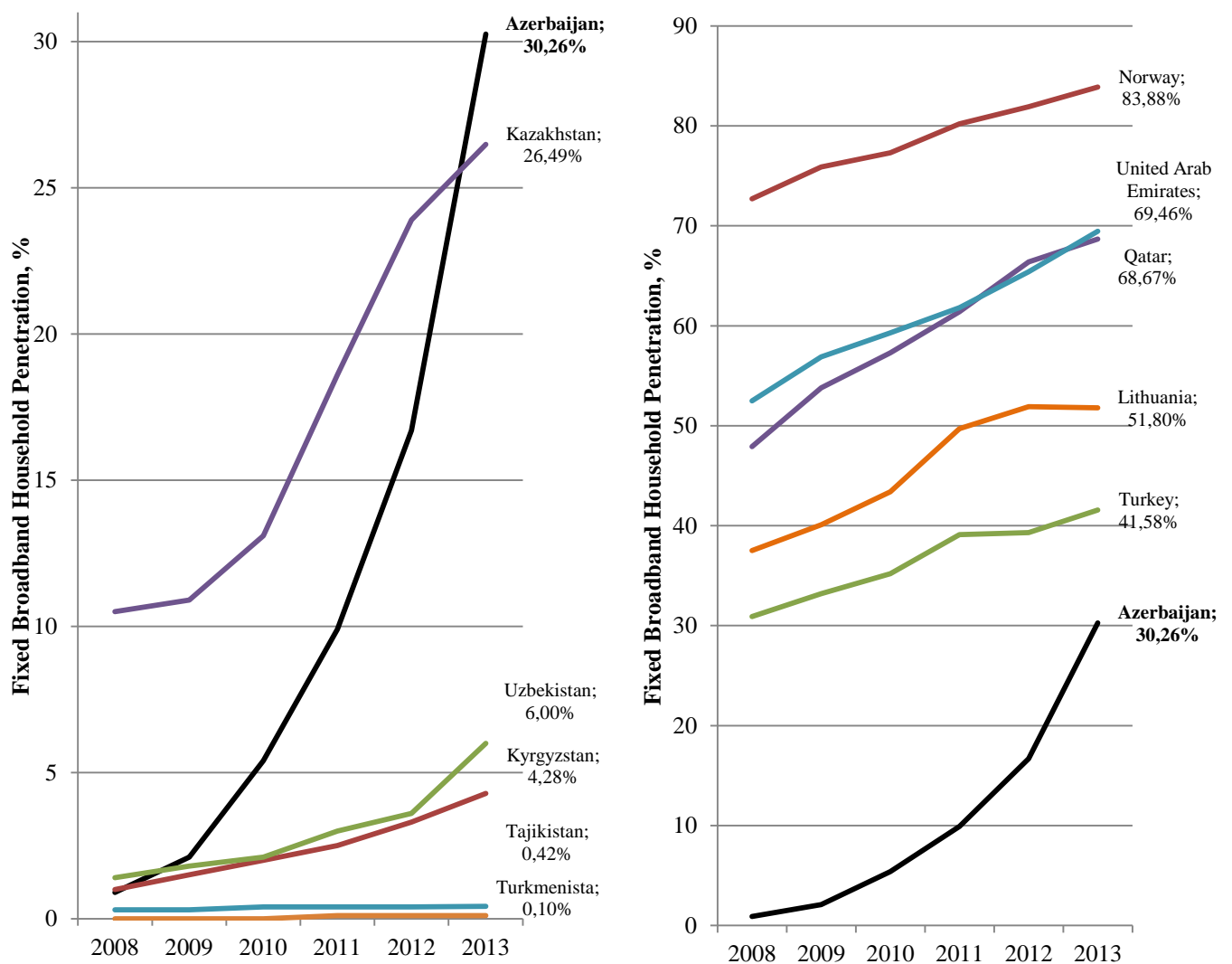
⁵³ See supra note 32.

⁵⁴ Based on the interviews with the alternative ISPs conducted by the World Bank in December 2013 and May 2014.

⁵⁵ Interview with Internet Society of Azerbaijan, May 6, 2014.

⁵⁶ See supra note 32.

⁵⁷ See supra note 32.



Note: Fixed broadband connections do not include modem (dial-up) connections. According to AzSTAT, 11.2% of all residential users and 24.4% of enterprises accessed Internet via dial-up connections in 2013.⁵⁸

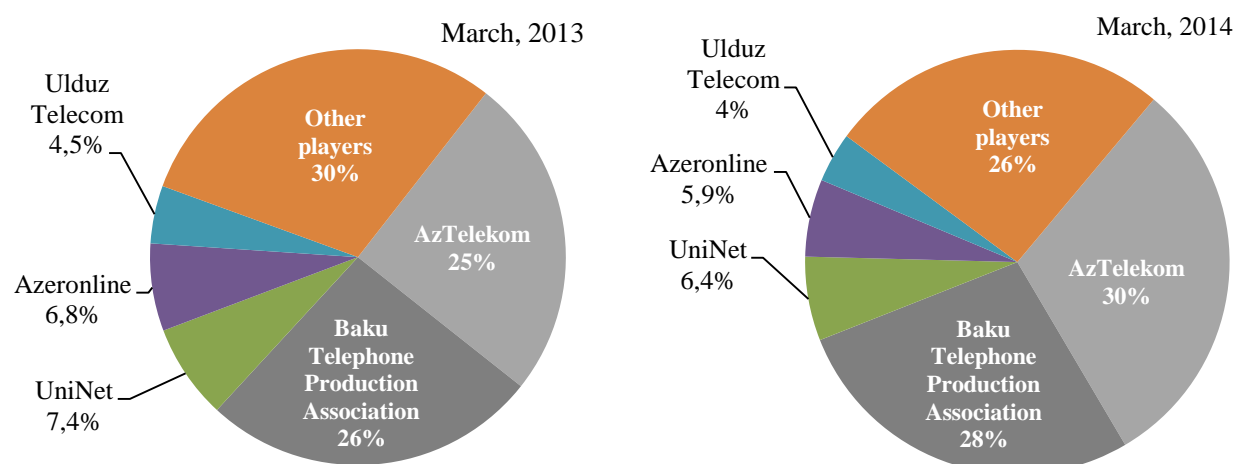
Source: TeleGeography GlobalComms Database, <http://www.telegeography.com>, May, 2014

24. Strong growth of the fixed broadband penetration in Azerbaijan could be accompanied by more efficient competitive environment. Cumulative market share of the alternative ISPs has dropped by 7% between 1Q 2014 and 1Q 2013, market concentration (HHI or Herfindahl-Hirschman Index) increased from 2753 to 3443 during the same period of time (Figure 9c). Market shares (subscribers) of the largest alternative ISPs are not significant and are, in fact, rapidly decreasing. As an example, in 2010, the market share of UniNet was 24% and of Ultel MMC – 15% whereas in March 2014 the market share of the former is only 6.4% and of the latter – 4%.⁵⁹ On the positive side, Azerbaijani broadband market structure can be characterized by quite high cumulative share of small ISPs (with market shares of <2%) (Figure 8).

Figure 8: Fixed broadband market shares (subscribers) in Azerbaijan, March 2013 and March 2014

⁵⁸ See supra note 22.

⁵⁹ Tim Kelly and Siddhartha Raja, ed., “Assessment of the Broadband Market and Connectivity Gaps in Azerbaijan, Armenia, and Georgia,” *Kalba International, Inc.*, Report for InfoDev, September 2011.



Source: TeleGeography GlobalComms Database, <http://www.telegeography.com>, September 2014

- 25. Alternative operators' growth and competition, necessary to sustain a sharp growth trajectory, are affected by the state-owned incumbents' dominant position in the market and absence of the market regulation on the wholesale level.** There is no independent regulatory body in the country which results in a deficient sector specific regulation, making it difficult to sustain competition in the market. Regulatory function is mainly performed by the Department on Regulation within MCHT. According to MCHT, wholesale markets related to the fixed broadband networks, such as wholesale unbundled local loop and bitstream access, wholesale access to terminating and trunk segments of the leased lines are not currently regulated.⁶⁰
- 26. When compared to regional peers, the number of households per ISP in Azerbaijan is higher than that of Uzbekistan or Kyrgyz Republic - two countries that have a higher market share of alternative operators** (Table 4). The number of households per ISP is even smaller in Lithuania and Norway which boast the highest fixed broadband penetration among the benchmark countries. Nonetheless, in view of the overall sharp growth of the fixed broadband market, the lower number of ISPs should not be seen as a major concern for Azerbaijan. Instead, greater attention should be given to ensuring the level playing field among the state-owned incumbents, backbone providers with significant market power, and alternative private companies already present on the market. Creation of more favourable conditions for their operation will increase competition and naturally attract more businesses into the market.

⁶⁰ Ministry of Communication and Information Technologies of the Republic of Azerbaijan (MCHT), "Current Situation in Telecom Regulation: Department of Regulation," accessed in April, 2013, <http://www.mincom.gov.az/nazirlik-ru-RU/page-419/page-601/>.

Table 4: Number of ISPs and market share of alternative players in benchmark countries, December 2013

Country	Number of ISPs	Number of HHs per ISP	Market share of the second biggest ISP	Cumulative market share of alternative operators
Azerbaijan	40*	50.000	6.6%	43.9%
Kazakhstan	110	60,909.09	10.4%	12.7%
Kyrgyz Rep.	210	6,190.48	18.9%	47.2%
Tajikistan	n.a.	n.a.	n.a.	n.a.
Turkmenistan	1	1.600.000	-	-
Uzbekistan	924	5,411.26	11.8%	61.3%
Lithuania	101	13,861.39	8.3%	50.8%
Norway	150	15,333.33	17.0%	55.2%
Turkey	237	85,654.01	10.6%	24.6%
Qatar	2	150,000	2.4%	2.4%
United Arab Emirates	2	750,000	14.9%	14.9%

Note: *The number is approximate. The real number is likely to be lower, according to the desk and field research.

Source: World Bank analysis⁶¹

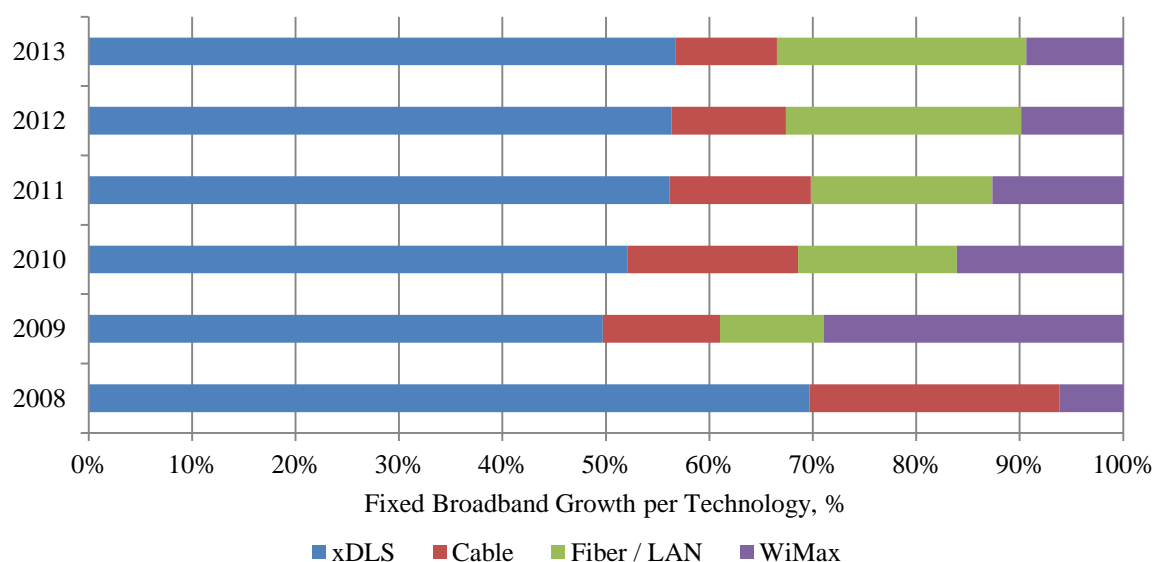
- 27. Most of the alternative operators, including the largest ones, are primarily competing for the business segment of the broadband market in the country's capital and major urban centers, which is consistent with the low level of market maturity.** Lack of interest from alternative operators to serve the country's rural and remote areas is also caused by potential difficulties in developing the rural infrastructure, including the absence of adequate wholesale access offers, which could help stimulate connectivity rollout outside the capital and major urban centers.⁶²
- 28. The majority of all fixed broadband connections are provided over xDSL infrastructure of the incumbent operators which is indicative of the low level of infrastructure-based competition** (Figure 9a). Similarly, most of the fiber optic connections are set up by incumbent operators Aztelekom and BTRIB. In service provision alternative players mainly rely on the xDSL infrastructure of the state-owned incumbents, although to a very limited extent. For instance, UniNet operates in the City of Baku offering retail services to residents and businesses mainly over xDSL. Ultel MMC offers broadband service over xDSL mainly to Baku businesses. Only the second largest alternative operator Azeronline, thanks to its affiliation with the country's largest mobile operator Azercell, offers broadband services over xDSL on the national

⁶¹ Based on TeleGeography GlobalComms Database, see supra note 32.

⁶² See supra note 54.

level and fibre (to residents in parts of Sumgait and to businesses in Baku).⁶³ It may be beneficial for Azerbaijan to pursue infrastructure-based competition approach as it exerts positive effects on network coverage, prices, and quality of services (See Box 1).

Figure 9a: Distribution of fixed broadband connections per technology in Azerbaijan, 2008-2013



Source: TeleGeography GlobalComms Database, <http://www.telegeography.com>, May 2014

Box 1: Infrastructure-based competition: Case of Lithuania

Infrastructure based competition is known for attraction of new investments and, subsequently coverage increase. It also results in more sustainable competitive environment and has stronger effect on prices and quality of services. Recent analysis of EU27 member states (2005-2011) concluded that sole promotion of service-based competition via cost-based access regulation will not elicit the huge new investment needed for a comprehensive Next-Generation Access (NGA) network roll-out, while infrastructure-based competition positively affects NGA deployment.

Lithuania is among those countries that have been promoting infrastructure-based competition. Following introduction of the cross-sector passive infrastructure-sharing framework in 2004-2005, FTTx deployment in Lithuania has been driven by alternative operators making use of existing passive infrastructure. FTTx became the dominant broadband technology in Lithuania in mid-2008 and spurred intense infrastructure-based competition amongst the ISPs, especially in the larger cities. At the end of 2013, FTTx accounted for 52.21% of all fixed broadband connections with over 60% of all FTTx connections being supplied by alternative operators.

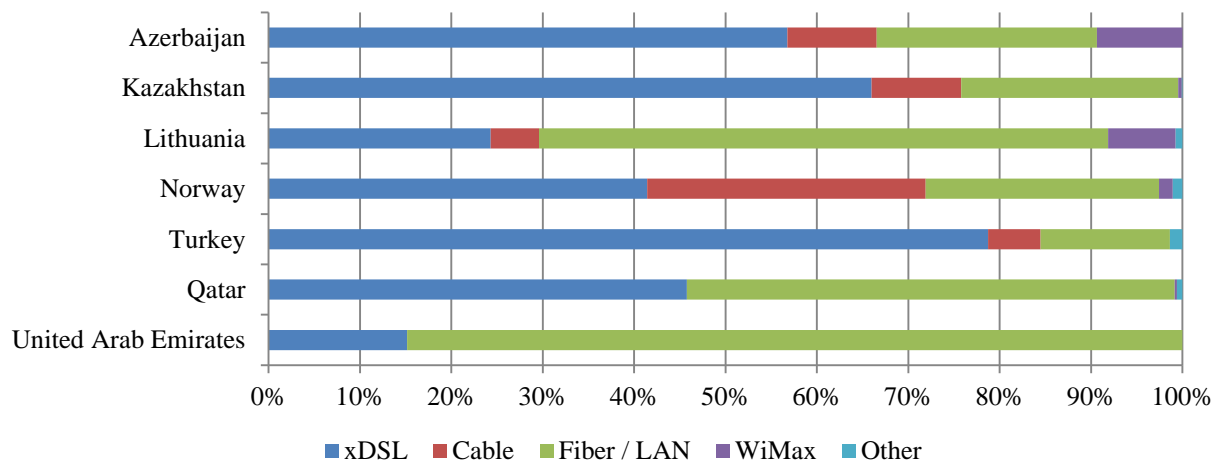
At the end of 2012, FTTx coverage in Lithuania reached 100% of households and one year later, overall broadband penetration stood at 87% of households. As a result, Lithuania now belongs to the countries with the most affordable access to broadband services and the highest level of high-speed broadband take-up – according to the Communications Regulatory Authority of the Republic of Lithuania (RRT), at the end of 2013, 37.3% of connections were between 30 Mbps and 100 Mbps, and 9.6% were faster than 100 Mbps, while only 4.4% of all connections were below 2 Mbps.

*Source: Communications Regulatory Authority of the Republic of Lithuania (RRT), “The Impact of Infrastructure and Service-based Competition on the Deployment of Next Generation Access Networks: Recent Evidence from the European Member States,” Wolfgang Briglauer, Georg Ecker, Klaus Gugler, *Information Economics and Policy*, Volume 25, Issue 3 (September 2013): 142–153.*

⁶³ Azeronline relies on Azercell’s network to reach consumers in the regions.

29. Experience of the benchmark countries enjoying a higher level of competition also shows higher technological diversity and better quality of services, whereas in the countries with high market concentration there is no place for inter-platform competition (Figures 9b and 9c).

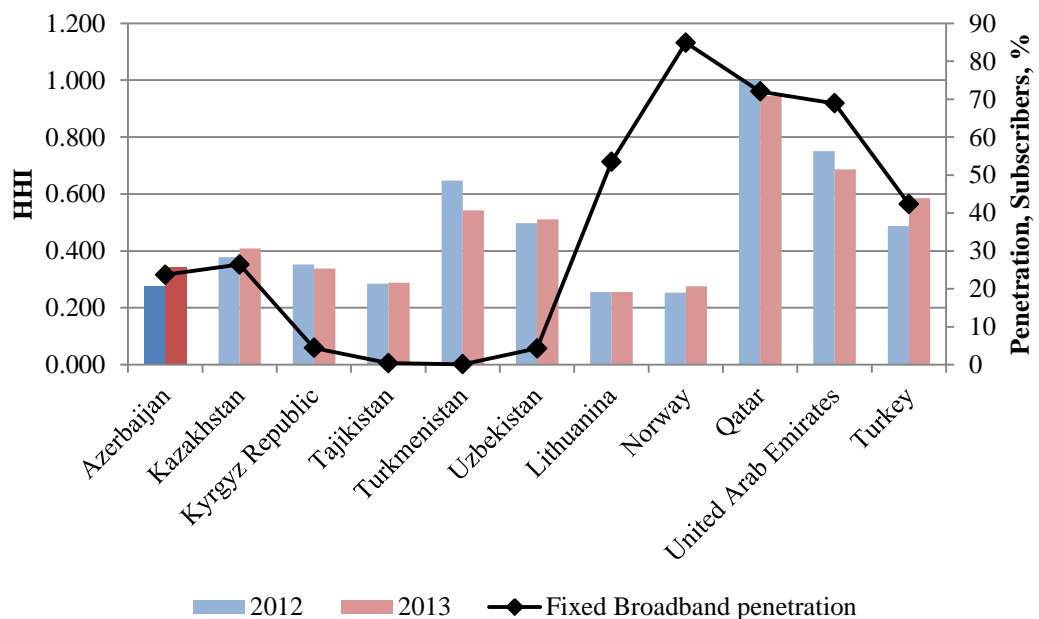
Figure 9b: Distribution of fixed broadband connections per technology in benchmark countries, 2008-2013



Note: Information for Uzbekistan, Kyrgyz Republic, Turkmenistan and Tajikistan is not available.

Source: TeleGeography GlobalComms Database, <http://www.telegeography.com>, May 2014

Figure 9c: Fixed market concentration 2012-2013 and fixed broadband penetration 2013 in benchmark countries



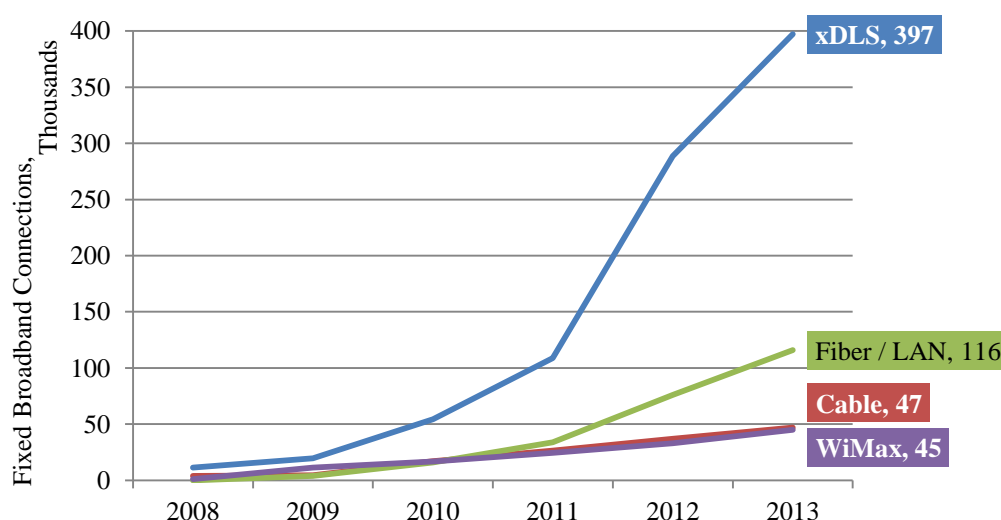
Note: for Azerbaijan information for Dec.2013 was not available; instead was used information for 1Q 2013-1Q2014

Source: World Bank analysis⁶⁴

⁶⁴ Data retrieved from TeleGeography GlobalComms Database, see supra note 32.

- 30. Speaking about existing technology mix, FTTx/LAN, DSL, Cable, and WiMax have been present in Azerbaijani market, the growth of the market, however, is mainly sustained by increase in the number of xDSL connections** (Figure 10). Similarly to other markets, except for Turkmenistan and Tajikistan, Azerbaijan is witnessing some increase in development of FTTx (See Table 5). Main FTTx networks in the City of Baku and the neighbouring villages have been developed and utilized for providing connectivity to residential customers by Az.StarNet, Aile Net, CityNet, Aktiv-Ol, Eurosel, Connect, and among other smaller players. Outside Baku, FTTx networks are growing in Sumgait (by Azeronline, Eurosel), Ganja (by Aile Net), other regional urban centers (by DataPlus, Eurosel), and in a number of rural villages and towns (by AzTelekom). Further increase of the FTTx connections is expected to take place when the state-led FTTx broadband plan will start to be tentatively implemented by AzTelekom, BakTelekom, and Nakhchivan MCHT.
- 31. Azerbaijan enjoys high household penetration of PSTN fixed telephony lines (72.6%), but only 27% of all broadband connections were delivered over xDSL technology, indicating higher utilization of existing infrastructure could still be possible** (Figure 11).⁶⁵ Out of benchmark sample, only United Arab Emirates and Qatar have higher PSTN penetration. Across the EU, in particular in Western Europe, fixed-line connections have been decreasing over the past decade driven by fixed-mobile substitution effect. However, Azerbaijan was able to improve and later retain a rather stable level of fixed-line penetration. Yet, only a small portion of existing connections is wholesaled in Azerbaijan, while the average in European countries is ~65%. This implies that another 30% of Azerbaijani households can still be connected to broadband Internet at reasonable costs assuming that copper networks are well maintained. Regulatory decisions are essential for this alternative to materialize. Experience of the EU proves that the local loop unbundling may be a pragmatic solution to boost broadband penetration at reasonable costs and within a short time frame (Box 2 and Box 3). Local loop unbundling may yield even greater benefits for Azerbaijan given its widespread PSTN network whose potential remains untapped.

Figure 10: Growth of the fixed broadband connections by technology, 2008-2013



Source: TeleGeography GlobalComms Database, <http://www.telegeography.com>, September, 2014

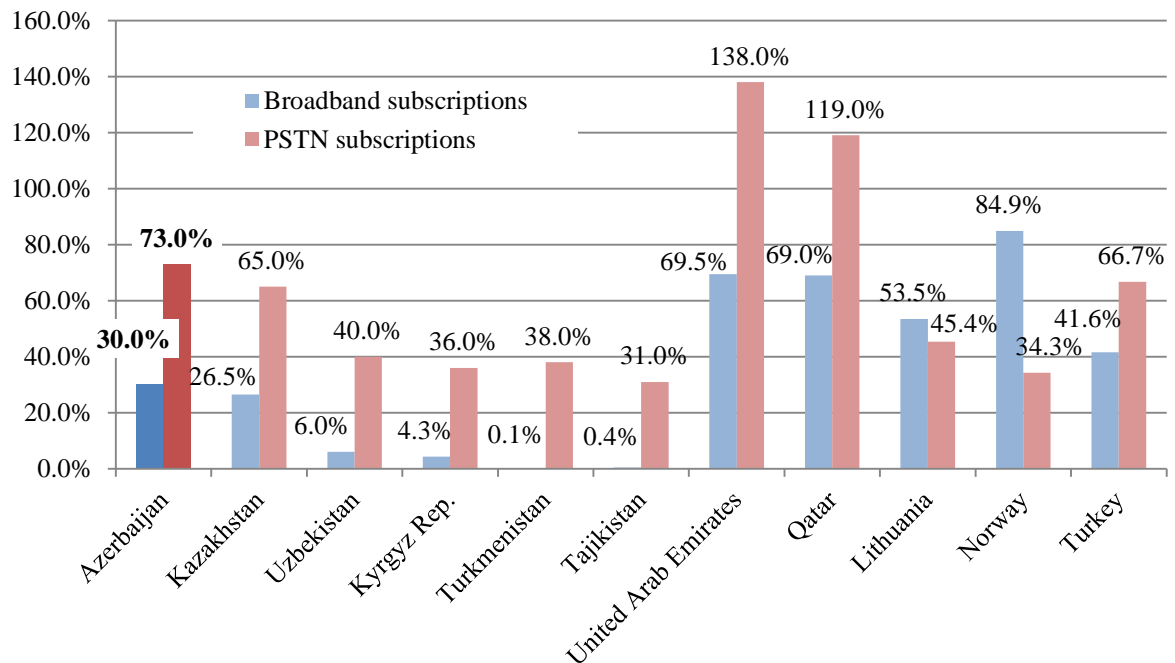
⁶⁵ TeleGeography, "Wireline," 2014, <http://www.telegeography.com/products/globalcomms/data/country-profiles/ee/azerbaijan/wireline.html>

Table 5: Technology mix in broadband Internet segment and subscriber growth in Azerbaijan v. benchmark countries

Country	Technologies mix as of December 2013 and direction of growth compared to December 2012				
	<i>FTTx / LAN</i>	<i>DSL</i>	<i>Cable</i>	<i>Other (incl. WIMAX)</i>	<i>Notes</i>
Azerbaijan	19% ↑	27% ↑	~8% ↑	7% ↑	Active rollout of ADSL and FTTx
Kazakhstan	~24% ↑	65% ↑	~10% ↑	1 ↓	
Kyrgyz Republic	n/a	n/a	n/a	↓	Active rollout of FTTx. DSL dominates the market
Tajikistan	n/a	n/a	n/a	n/a	DSL and WIMAX dominate the market
Turkmenistan	-	100%	-	-	-
Uzbekistan	n/a	n/a	n/a	n/a	FTTx is developing in urban areas; active upgrade to ADSL
Lithuania	62% ↑	24% ↓	5% ↓	8 ↑	Active rollout of FTTx and WiMax (in suburban and semi-rural areas)
Norway	~26% ↑	41% ↓	30% ↑	~3% ↑	Fibre and cable squeeze out xDSL
Turkey	14% ↑	79% ↑	~6% ↓	1% ↓	High speed broadband rollout. No WiMax operators are present at the market
Qatar	53% ↑	~46% ↓	n/a	1% ↑	ADSL was dominating until the rollout of FTTx
United Arab Emirates	~85% ↑	~15% ↓	n/a	n/a	Active FTTx rollout; DSL is squeezed out

Source: TeleGeography, GlobalComms Database, <http://www.telegeography.com>, September, 2014

Figure 11: Fixed broadband penetration compared to PSTN penetration in Azerbaijan v. benchmark countries, December 2013



Source: TeleGeography, GlobalComms Database, <http://www.telegeography.com>, September 2014

Box 2: Utilization of PSTN infrastructure: success stories from Germany and France

The existing fixed-line PSTN infrastructure usually provides some potential for fast broadband growth at a reasonable cost. Most often fixed telephony infrastructure (PSTN local loops) is upgraded for delivery of broadband services, typically through application of xDSL technologies on copper networks.

For instance, in Germany out of 28,7 million PSTN connections provided by Deutsche Telekom AG (DTAG), 23,3 million xDSL lines were in service at the end of 2012 and near 12.4 million of those xDSL connections were retailed to end customers by DTAG competitors. While xDSL remains dominant technology for fixed broadband provision in Germany, speeds of broadband connections are high with more than 80% of overall connections being above 2Mbps and over 40% - above 10Mbps.

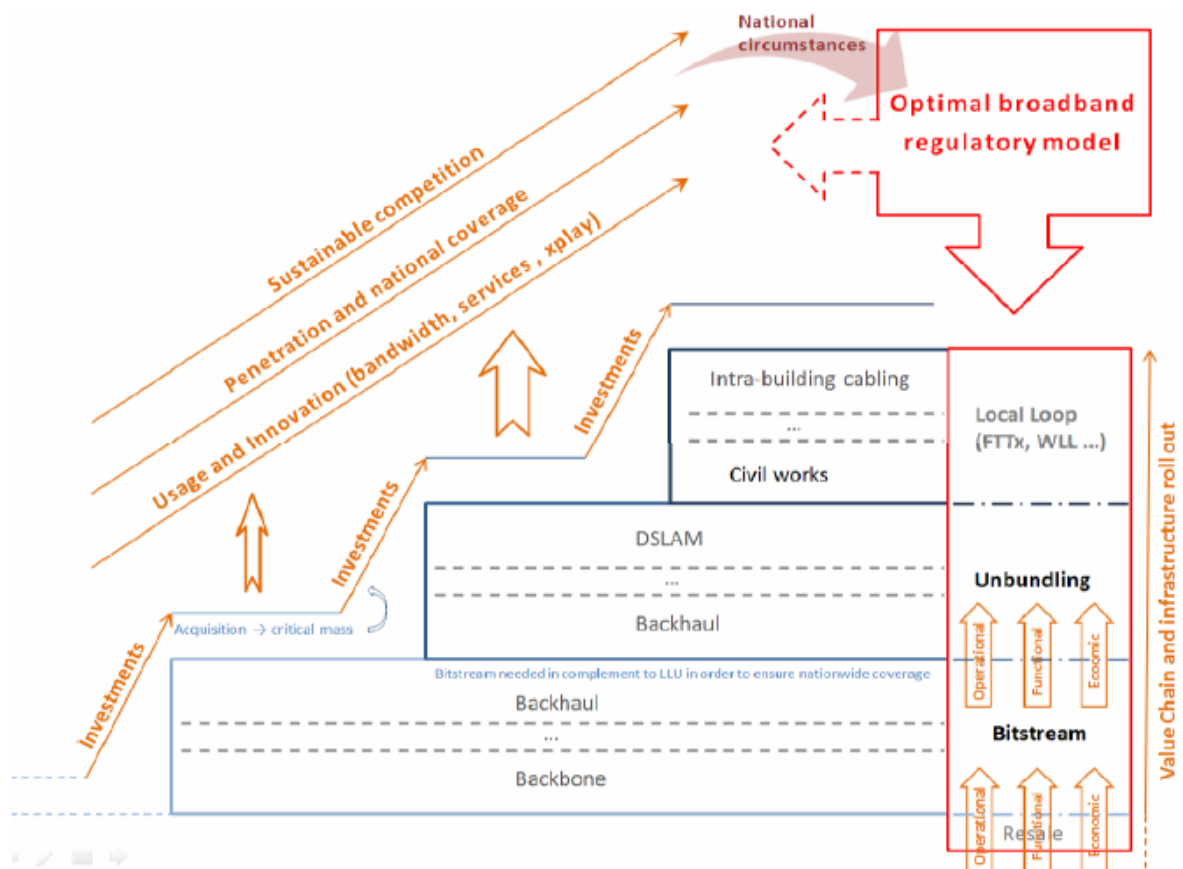
Similar to Germany, most of modern broadband coverage in France is supplied by xDSL technologies over the France Telecom (FT) telephone network. Out of around 33 million PSTN lines deployed across the country, 88% are eligible to supply triple play service over xDSL. As of 2012, over 80% of all existing PSTN lines in France were wholesaled.

Source: Annual Report, 2012, Bundesnetzagentur für Elektrizität, Gas, Telekommunikation, Post und Eisenbahnen, 2013; Annual Report 2012, Autorité de régulation des communications électroniques et des postes (ARCEP), 2013

Box 3: Ladder of investment and regulated wholesale broadband offers

In the telecommunications sector the "ladder of investment" (Cave 2006) refers to a regulatory approach that aims to reconcile service-based competition (where entrants lease access to incumbents' facilities) and facilities-based competition (where they build their own infrastructure).

By setting low wholesale DSL regulated prices the regulator encourages service-based competition. Then, once entrants have built a customer base and gained market information, they can move up "the ladder of investment" and invest in their own facilities. The regulator should then increase the access price in order to encourage entrants to climb up to the next rung, i.e., invest in national backbone infrastructure through the use of bitstream and invest in regional infrastructure through local loop unbundling. Ultimately, entrants can develop their own access network, with full facilities-based competition.



Source: Gelvanovska, Rogy and Rossotto, 2014

Source: Gelvanovska, Natalija, Michel Rogy, and Carlo M. Rossotto. *Broadband Networks in the Middle East and North Africa: Accelerating High-Speed Internet Access*. Washington, D.C.: The World Bank, 2014. <https://openknowledge.worldbank.org/handle/10986/16680>.

Cave, M. 2006. "Encouraging Infrastructure Competition via the Ladder of Investment." *Telecommunications Policy* 30 (3-4): 223-37.

- 32. However access to the existing infrastructure could only partially support broadband take-up, as there are still many more broadband connections that need to be deployed, particularly outside Baku.** A striking discrepancy persists between the urban and rural areas and between the fixed telephony coverage in Baku v. rest of the country. By end-2012, under 80% of all landlines were located in the urban areas while the remaining 20% of landlines were found in the regions. The access divide is even more striking if one considers that the capital of Baku alone has 47% of total fixed landlines and that this situation has not changed significantly over the last decade.⁶⁶ In the worst underserved municipality (Salyan region), only one rural family out of twelve has a telephone line.⁶⁷
- 33. Overall, Azerbaijan's fixed broadband market is still in its emerging phase. Regulatory reform is increasingly crucial for further development given increasing market concentration and absence of the level playing field, in particular, between incumbents and alternative operators.** Government control over the sector has been cited as one of the reasons for fixed broadband sector under-development; the mandate of the MCHT as a policy maker, regulator and owner of the two largest incumbents has been raising concerns among local and foreign investors.⁶⁸

3.2.2. Characteristics of supply of the mobile broadband services

- 34. In contrast to fixed, development of Azerbaijan mobile market so far has been a good example of how efficiently competition can drive the growth of the market and lead to provision of affordable high quality services.** First mobile network in Azerbaijan was launched in 1994 and from 1996 until 2005 there were just two operators in the country – Azercell and Bakcell. With introduction of the third market player (Azerfon) in 2005 total number of subscribers increased by an average of 45% in 2006 and 2007 and 25% during the following two years. Growth was also catalysed by the privatisation of biggest network operator in 2008. More recently as market approaches the saturation point the annual rate of growth has begun to decelerate – slowing to 9.0% in 2011, 6.2% the following year and by less than 2% in 2013.⁶⁹
- 35. However, mobile telephony penetration in Azerbaijan is significantly lower than the average penetration in Eastern Europe - 157.1%⁷⁰ or in the selected Central Asian countries – 116%.⁷¹ With 108⁷² mobile subscriptions per 100 people Azerbaijan underperforms in comparison with the developed world which boasts over 120.⁷³**

⁶⁶ AzSTAT, as cited in TeleGeography, „Wireline,“ 2014, <http://www.telegeography.com/products/globalcomms/data/country-profiles/ee/azerbaijan/wireline.html>.

⁶⁷ AzSTAT, “Number of Telephone Lines per 100 Rural Families,” <http://www.stat.gov.az/source/communication/indexen.php>.

⁶⁸ See supra note 54.

⁶⁹ See supra note 32.

⁷⁰ See supra note 51.

⁷¹ The average of Kazakhstan, Kyrgyz Republic, Turkmenistan, Uzbekistan, and Tajikistan. TeleGeography, 2013.

⁷² World Bank Data, World Development Indicators, “Mobile Cellular Subscriptions (per 100 People), 2012,” <http://data.worldbank.org/indicator/IT.CEL.SETS.P2>.

⁷³ See supra note 51.

Table 6: Azerbaijan's mobile operators, network coverage, and ownership, 2013

Operator	Mobile telephony	Coverage		Ownership
		Mobile Broadband		
		3G / 3.5G	4G	
Azercell	99.8% pop., 80% territory	All major cities	Baku, Seaside National Park, Absheron Peninsula	<i>Private 100%</i>
Azerfon	80% territory	Main towns and cities	In deployment	<i>Public 0.03%, private 99.,97%</i>
Bakcell	99% pop., 93% territory	Feb-14: 80% pop., 55% territory / Baku	Commercially launched in early 2014	<i>Public 10%, private 90%</i>

Source: Publicly available information, TeleGeography Globalcomms Database, <http://www.telegeography.com>, June 2014

36. Mobile telephony market is regulated with all three mobile operators considered to be holding a significant market power. Mobile termination rates first were established at 0,05 AZN/min, but were cut in 2009 to 0,02AZN/min which is below the EU average.⁷⁴ When it comes to market definition, Ministry seems to selectively follow European Union (EU) approach for market analysis with list of 18 pre-defined markets susceptible for ex-ante regulation.⁷⁵ Market analysis and interconnection between the telecom operators is regulated by the secondary legislation adopted by the Ministry. Overall regulatory framework in case of mobile telephony market analysis seems to be transparent and allowing legal certainty.

37. Comparison of market concentration index (HHI)⁷⁶ reveals that Azerbaijan enjoys the third most competitive market structure among benchmark Central Asia countries with positive development dynamics (Figure 12). It is expected that positive dynamics will be supported by the recent launch of the Mobile Number Portability in February 2014,⁷⁷ which should intensify competition and benefit Azerbaijani consumers. Countries with more intense competition (lower HHI) also enjoy higher penetration, and vice versa (one exception in the region is Kazakhstan), e.g. in the case of Russia, one of the fastest growing mobile market globally, HHI was on the level of 2009 in 2012.⁷⁸ While high mobile telephony penetration can be noticed in the United Arab Emirates and Qatar, as it will be shown later, lack of competition results in the lower level of service quality, which in the case of broadband services is directly related to the quality of connection speeds.

⁷⁴ As of July, 2013, simple average of EU + Switzerland, Norway, Serbia, FYR Macedonia, Iceland and Turkey was 2.21 eurocents/min. See Body of European Regulators for Electronic Communications (BEREC), "Termination Rate Benchmark Snapshot," November 2013, http://berec.europa.eu/eng/berec_office/search?q=termination+rate.

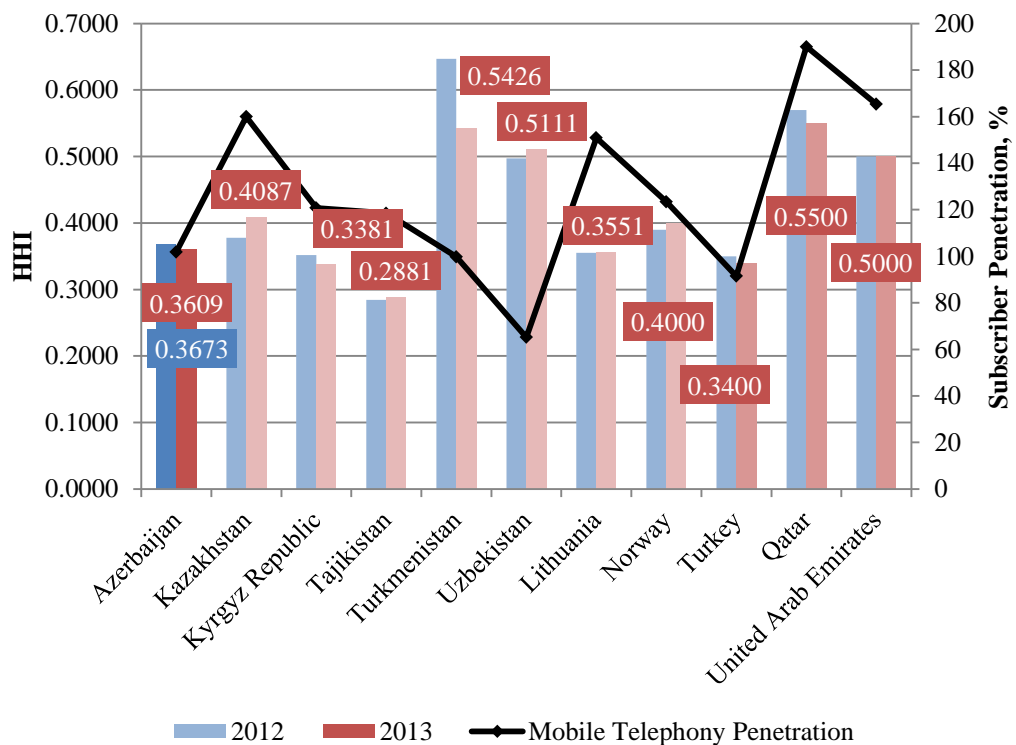
⁷⁵ Established by the European Commission Recommendation Nr C(2003)497.

⁷⁶ Herfindahl-Hirschman index.

⁷⁷ "Mobile Number Portability Service Launched in Azerbaijan," News.Az, <http://www.news.az/articles/tech/86250>.

⁷⁸ Natalija Gelvanovska et al., "Russia Broadband Note," World Bank Report to be published in 2014.

Figure 12: Mobile Market Concentration 2012-2013 and Penetration 2013 in Azerbaijan v. benchmark countries



Source: World Bank analysis⁷⁹

38. The same three mobile operators also share the entire mobile broadband market in Azerbaijan with more evenly distributed market shares than in the case of mobile telephony market (Figure 13). In terms of the coverage, Bakcell owns the most extensive network with over 99% of the population covered according to the company, while in case of 4G Azercell has launched commercial 4G services in couple of major urban centers (See Table 6). In the period of June 2012-December 2013, the company signed up 50,000 4G customers who represent a little over 1% of company's total subscriber base and are based in Baku and Absheron Peninsula.⁸⁰ The competition in the mobile broadband segment intensified starting from the end of 2011 when Azercell and Bakcell were finally allowed to launch 3G services.⁸¹

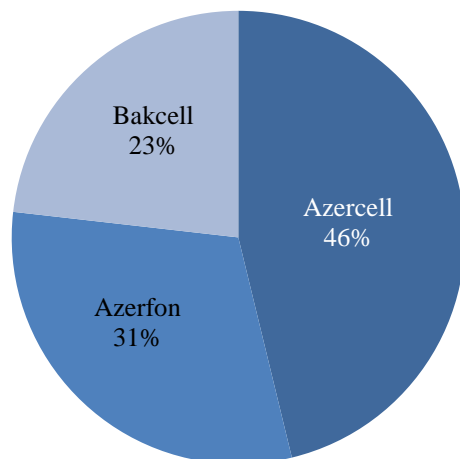
⁷⁹ Data retrieved from TeleGeography GlobalComms Database, see supra note 32.

⁸⁰ Ibid.

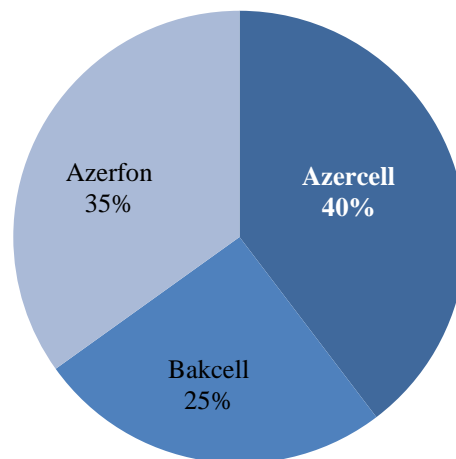
⁸¹ Ibid.

Figure 13: Structures of Mobile Telephony and Mobile Broadband Markets, December 2013

Mobile Telephone Market (subscribers), 2013



Mobile Broadband Market (3G and 4G subscribers), 2013



Source: TeleGeography GlobalComms Database, <http://www.telegeography.com>, September 2014⁸²

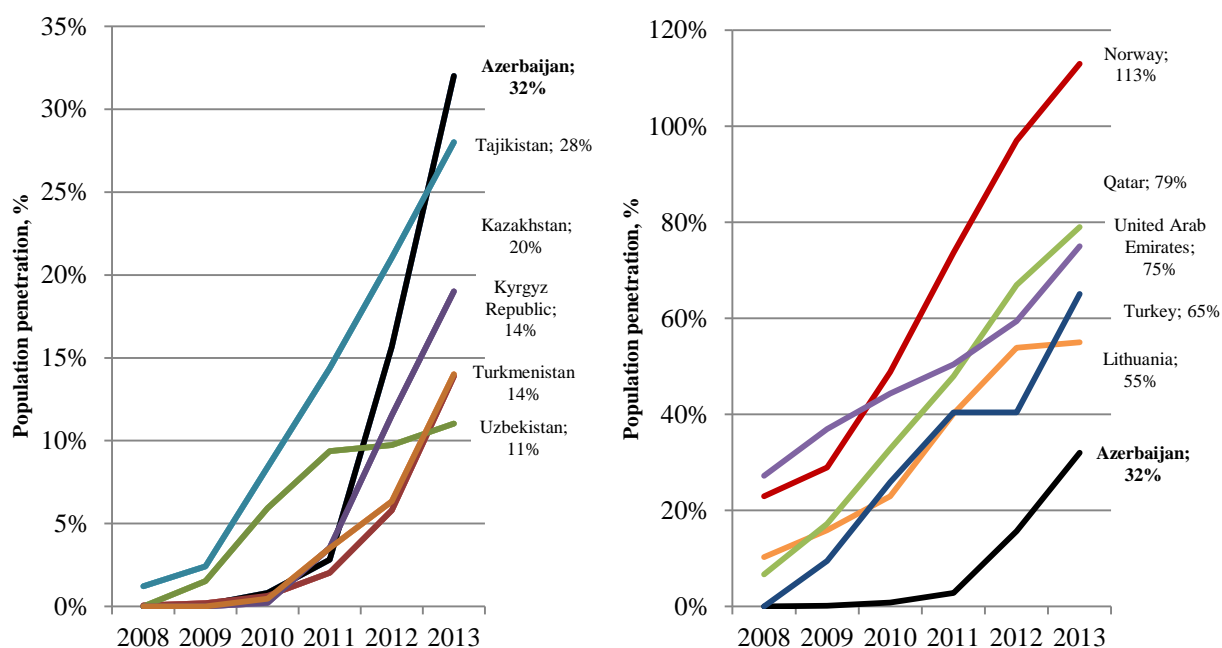
39. Azerbaijan shows the strongest growth rate in the region in terms of mobile broadband surpassing Kazakhstan and more recently Tajikistan, however even better results could be achieved if the mobile broadband services were launched earlier (Figure 14). As of end-2013, the country's mobile broadband population penetration (3G & 4G) was estimated at 32%. This figure is, however, two times lower than the average mobile broadband penetration per capita in the United Arab Emirates and Qatar, which are two oil-exporting economies, similar to Azerbaijan (Table 7). The difference may be explained by the later launch of 3G services in Azerbaijan as compared to the other two countries. Azerfon got permission to launch 3G services in 2009; Bakcell and Azercell – 4Q 2011. Until now only one operator (Azercell) is permitted to use frequencies to provide 4G services which cover the city of Baku and Absheron peninsula. According to MCHT all involved parties, including State Commission on Radiofrequencies, and operators, work toward release and redistribution of remaining frequency bands that required for Bakcell and Azerfon⁸³ Operators and NGOs would like to see process moving faster⁸⁴.

⁸² See supra note 32.

⁸³ For instance, operators are required to apply necessary network infrastructure.

⁸⁴ “<...> allocation, but not yet the permission to use the allocated LTE (4G) frequencies by all mobile operators, demonstrates that there is still need for improvement in the establishment of healthy competition in the Azerbaijani mobile communications market.” American Chamber of Commerce in Azerbaijan (AMCHAM), „Observations and Recommendations for improving Azerbaijan's business climate,” 2014.

Figure 14: Growth of mobile broadband penetration, 2008-2013 in Azerbaijan v. benchmark countries



Source: TeleGeography, GlobalComms Database, <http://www.telegeography.com>, September 2014⁸⁵

Table 7: Mobile broadband development in Azerbaijan v. benchmark countries, December 2013

Country	Mobile telephony penetration per capita 2013, %	Mobile Broadband (3G and 4G) penetration per capita 2013, %
Azerbaijan	101	32
Kazakhstan	158	19
Kyrgyz Republic	119	14
Turkmenistan	109	14
Tajikistan	119	28
Uzbekistan	65	11
Lithuania	155	55
Norway	124	113
Turkey	93	65
Qatar	175	79
United Arab Emirates	168	75

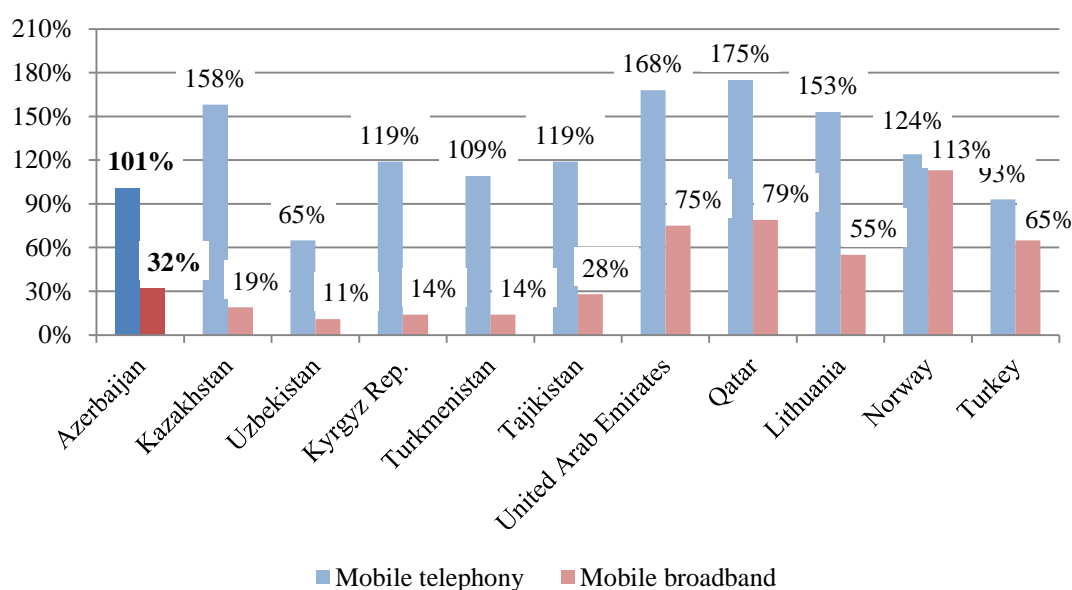
Source: TeleGeography, GlobalComms Database, <http://www.telegeography.com>, September 2014⁸⁶

⁸⁵ See supra note 32.

⁸⁶ Ibid.

40. The ratio between mobile telephony and mobile broadband subscribers indicates that one third of total mobile subscribers are subscribed to mobile broadband services in Azerbaijan, which is a good result at the regional level, yet the market is far from saturation as is the case of Norway or the United Arab Emirates. To reach the point of saturation both markets need to continue pursuing a positive growth trajectory, which is likely to be strengthened following the launch of Mobile Number Portability and LTE services by Bakcell and Azerfon in the second and fourth quarter of 2014, respectively.⁸⁷

Figure 15: Ratio between mobile telephony and mobile broadband (3G and 4G) subscriptions in Azerbaijan v. benchmark countries, December 2013



Source: TeleGeography, GlobalComms Database, <http://www.telegeography.com>, September 2014⁸⁸

41. Taking into account rather underdeveloped fixed broadband market with weak competition, mobile broadband may be considered to be a more realistic alternative in the short term for broadband coverage in rural Azerbaijan, even despite the fact that only one of three operators is offering mobile broadband services in the country's regions. Whether mobile broadband networks will be deployed in the rural areas depends on the nature of geographical and/or population coverage obligations included into the licenses and financial incentives provided by the state. As for today, each mobile operator is rolling out individual network infrastructure for mobile broadband.⁸⁹ Experience of other countries, in particular when it comes to the roll out of the 4G networks, shows that better (in terms of costs) and faster (in terms of the roll-out) results could be achieved if operators would look for potential synergies and network sharing opportunities (Box 4).

42. Essential for coverage of rural areas low frequency bands still need to be freed up from the broadcasting services through the switchover from analogue to digital TV. MCHT announced plans to allocate spectrum in 790MHz-862MHz bands for mobile operators, however no timeframe for such allocation is established at the moment of writing this paper.⁹⁰

⁸⁷ See supra note 32.

⁸⁸ Ibid..

⁸⁹ See supra note 54.

⁹⁰ See supra note 32.

Box 4: Mobile Network Operators are Pioneers in the Optimization of Network Costs

Mobile network operators are pioneers in the optimization of network costs. With penetration reaching saturation point and increasing margin pressure toward competitive levels, optimization solutions have already gone far beyond traditional infrastructure sharing on active (e.g., radio access network) or passive (towers, sites, and so on) levels to creation of more advanced capacity outsourcing models. Indeed, beyond more “traditional” network optimization approaches (one network—one operator), alternative network models (many operators—one network, many operators—outsourced network) promise new cost savings and are being explored in particular between mobile operators. Below are briefly presented some of the possible approaches:

(1) Network outsourcing is a partnership between a telecom operator and an equipment vendor under which the equipment vendor builds and operates network infrastructure for which a telecom operator is purchasing capacity needed to provide its services. This kind of partnership is also known as a managed capacity agreement;

(2) Network sharing is a form of partnership between telecom operators aiming to decrease capital investment in infrastructure and lower operational costs through rollout and operation of shared network infrastructure. This model is increasingly popular in the case of third generation of mobile telecommunications technology (3G) and fourth generation of mobile telecommunications technology (4G) network rollout. Under the deal, separate networks of participating operators are transformed into a single network infrastructure that is shared by all the participants. In the case of new deployments, each operator may be responsible for coverage of a certain geographic area;

(3) Network outsourcing combined with network sharing is a form of partnership between telecom operators and an equipment vendor under which an equipment vendor builds and operates network infrastructure that is shared by multiple operators.

Source: Based on Gelyanovska, Natalija; Rogy, Michel; Rossotto, Carlo Maria. 2014. Broadband Networks in the Middle East and North Africa: Accelerating High-Speed Internet Access. Washington, DC: World Bank. © World Bank. <https://openknowledge.worldbank.org/handle/10986/16680> License: CC BY 3.0 IGO.

3.2.3. Assessment of the speed of Internet connections

43. Azerbaijan strikingly underperforms in terms of Internet connection speeds when compared to the benchmark countries. To reach the level of the consumer download speed of Kazakhstan, a speed frontrunner in Central Asia, the download speed of Azerbaijan needs to increase over three times. According to the Household Download Index developed by Ookla,⁹¹ Azerbaijan was ranked 115th on the list of 190 countries, with consumer download broadband speed of **6.3 Mbps** and upload speed of **4.3 Mbps**. Mobile broadband download speed is measured at **6.5 Mbps** and upload – **2.1 Mbps**. The highest consumer download broadband speed recorded in Baku during the analyzed period was provided by the following ISPs: UniNet (18.72Mbps); Azertelecom (8.68Mbps), and Delta Telecom (8.53Mbps). On these parameters, Azerbaijan lags significantly behind the EU, APEC countries, and global average (Figure 16).⁹² In 2012, the country had a high number of dial-up Internet access connections which are becoming less and less common in the region, e.g. in EU.

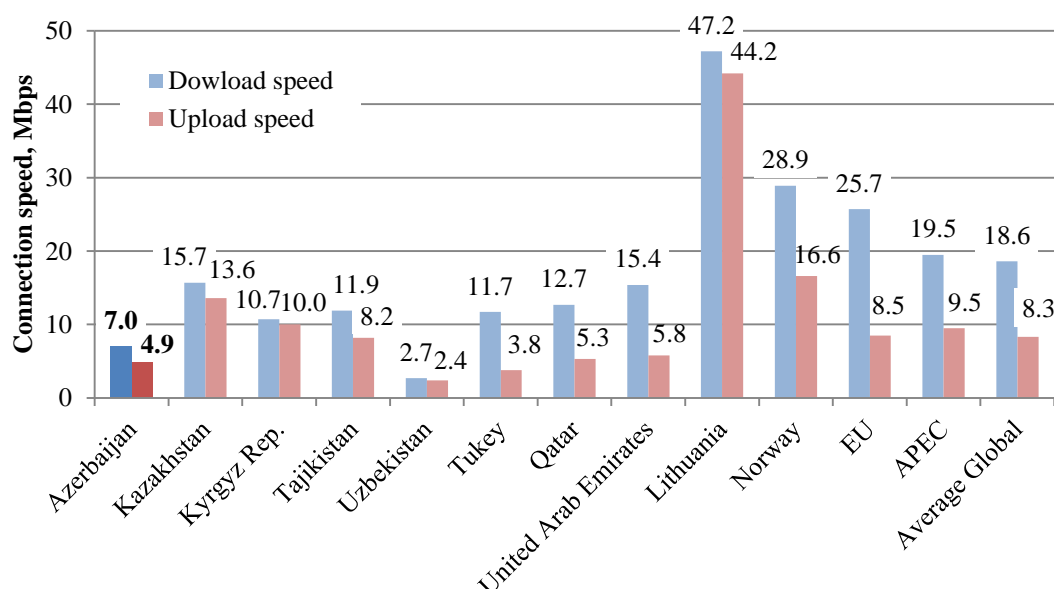
44. It important to mention that countries with a high market concentration index (HHI), despite having a high and very high level of broadband penetration (e.g. Qatar, United Arab Emirates or Turkey), may be similarly characterized by a low level of both upload and download connection speeds. In this regard, these countries follow suit of Central Asian countries. By contrast, the countries with a high level of competition (Lithuania or Norway) overperform in terms of connection speeds not only the sample countries, but also EU, APEC or global averages. The same observation could be drawn when average connections

⁹¹ The company compares and ranks consumer download speeds around the world. For more information, see: www.ookla.com.

⁹² Ookla, “Ookla Net Index: Global Broadband,” accessed on June 10, 2014, <http://www.netindex.com/download/allcountries/>
Note: Results were obtained by analyzing test data between May 11, 2014 and June 9, 2014. Tests from 389,621 unique IPs have been taken in Azerbaijan and of 2,546,740 total tests, 123,459 are being used for the current Ookla Index.

speeds, number of high speed connections, and International Internet bandwidth per user are analyzed.

Figure 16: Benchmark of upload and download consumer connection broadband speeds, June 23, 2014



Source: Household Download Index, Ookla

45. The number of higher speed connections (over 4Mbps) is persistently lower than 10% of all connections, with a very slow increase over the last two years. For instance, in Kazakhstan such connections make up one third of all connections. The higher the prevalence of high speed broadband Internet in a country, the more favourable effects can be expected in the short-term. Availability of high-speed, reliable, and reasonably-priced Internet access is also considered a key determinant in FDI decisions.⁹³ The average connection speed in Azerbaijan has been improving since 2008 and reached **2,868 Kbps** in the fourth quarter of 2013,⁹⁴ but still remains among the lowest in the sample (Figure 17).⁹⁵ According to Akamai, the majority of connections in Azerbaijan are under 4Mbps but greater than 256Kbps (Figure 18).

46. The number of dial-up connections is still quite high in Azerbaijan, which may imply lower performance in terms of connection speeds. AzSTAT's 2013 survey of Internet access at enterprises shows that 24.4% of all connections are dial-up, 26.0% are DSL below 2Mbps, 29.6% - DSL over 2Mbps, 6.8% - wireless, 10.3% - other (with a dedicated line).⁹⁶ A similar survey on the household level posits that 11.2% of all households have a dial-up connection, 28.9% get connected via a mobile phone, and 59.6% by broadband.⁹⁷ A significant share of the dial-up connections and mobile phone 3G connections is a possible reason for low average connection speed.

⁹³ Mona Badran, "The Impact of Broadband Infrastructure on Economic Growth in Some Arab and Emerging Countries," *Topics in Middle Eastern and African Economies*, No.14 (September 2012): 278-320, <http://ecommons.luc.edu/cgi/viewcontent.cgi?article=1161&context=meea>.

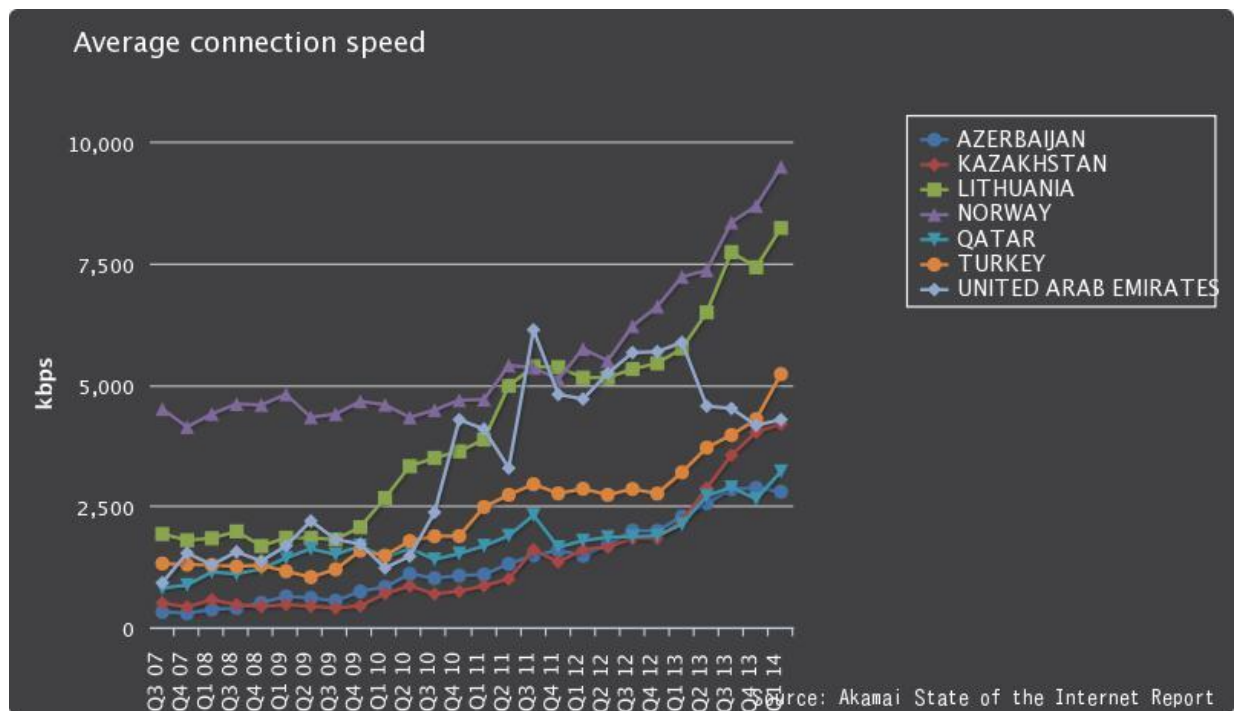
⁹⁴ Akamai, "The State of the Internet," accessed on May 17, 2014, <http://www.akamai.com/stateoftheInternet/>.

⁹⁵ Note: Uzbekistan and Turkmenistan were not given as options for visual graph benchmarking.

⁹⁶ AzSTAT, "Core Indicators of ICT Use at Enterprises," <http://www.stat.gov.az/source/communication/indexen.php>.

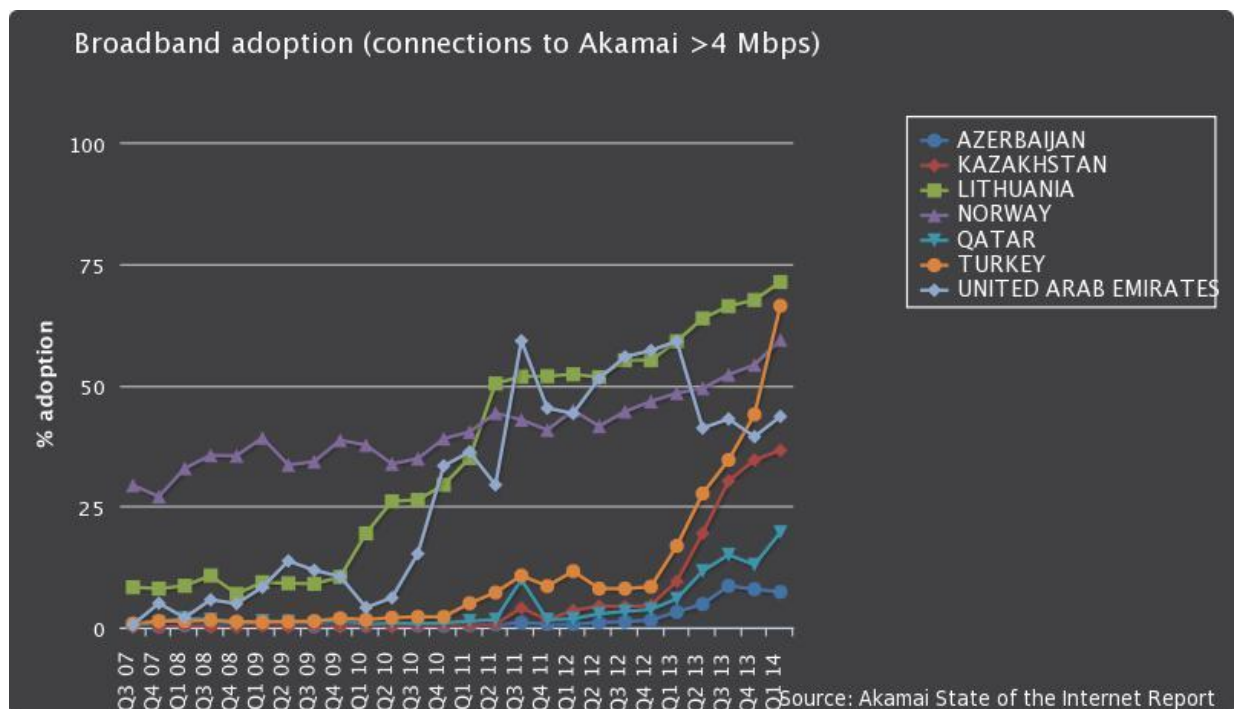
⁹⁷ See supra note 22.

Figure 17: Average connection speeds in Azerbaijan v. selected countries, Q3 2007 – Q1 2014



Source: Akamai

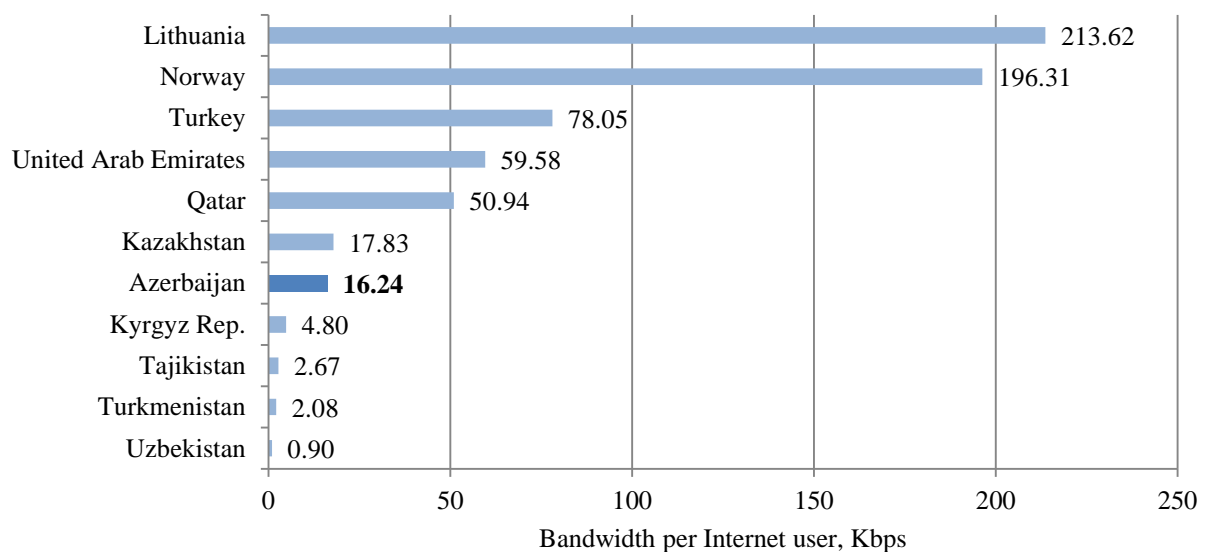
Figure 18: Broadband adoption in Azerbaijan v. selected countries, Q3 2007 – Q1 2014



Source: Akamai

47. In terms of International Internet bandwidth per Internet user, Azerbaijan outperforms most of the peers in Central Asia. International bandwidth of Azerbaijan has been growing over the years, with the compound annual growth rate being 111% in 2005-2013. The fastest growth was observed in 2007-2008 (409%) and 2011-2012 (272%). In 2013, the country's bandwidth reached 81,810Mbps, which is higher than median bandwidth of 54,897Mbps among 172 measured countries.⁹⁸ However, comparing to global leaders, traffic per person in Azerbaijan is 12 times lower than in Norway, and over 13 times lower than in Lithuania.

Figure 19: International Internet bandwidth (Kbps) per Internet user in Azerbaijan v. benchmark countries



Source: World Bank analysis⁹⁹

48. In contrast to the removal of entry barriers to telecom activities for ISPs, wholesale access to international gateways is still under state-owned control. There are only two operators in Azerbaijan (Table 8) licensed to connect international IP traffic, with Delta Telecom handling the majority of ISP traffic in the country. A privately-owned company Delta Telecom is a primary provider of international IP transit in the country supplying international connectivity to at least 90-95% of all users and a transit operator of Azerbaijan's segment of Europe Persia Express Gateway (EPEC). The company has created the first Internet backbone in Azerbaijan and in Trans-Caucasus, carrying large capacity Internet traffic through the primary existing gateways with Russia, secondary – with Georgia, and a backup gateway via Iran. Delta Telecom has external fiber-optic connections with Russia via TransTelecom and with Turkey via RosTelecom. Indirectly, Delta Telecom serves Georgian users, since a local service provider TransEuroCom purchases international traffic from Delta Telecom and then carries it using fiber connections to Georgia. Through the TRACECA Fiber Optic Cable line, TransEuroCom is also connected to the TurkTelecom in Turkey.¹⁰⁰ Delta Telecom owns a direct link to the Stockholm traffic exchange, while DWDM technology supports 40Gbps data transmission capacity on its domestic network.¹⁰¹ According to the backbone provider, the price of its wholesale Internet

⁹⁸ TeleGeography, "Bandwidth by Country," 2013, <http://www.telegeography.com/products/global-internet-geography/>.

⁹⁹ The data is based on supra notes 98, 34, and on World Bank, World Development Indicators, "Internet users (per 100 people)," 2012, <http://data.worldbank.org/indicator/IT.NET.USER.P2>.

¹⁰⁰ OpenNet Initiative, "Azerbaijan," <https://opennet.net/research/profiles/azerbaijan>.

¹⁰¹ See supra note 54.

offers was reduced 140 times in 2004-2010.¹⁰² Delta Telecom controls the only Internet Exchange Point (IXP) in Azerbaijan and charges the same amount for local and international traffic.¹⁰³

49. The other licensee – Azertelecom – has its fibre-optic cable network covering all major regions and cities of Azerbaijan, including Nakhchivan Autonomous Republic. It also connects Azerbaijan to international partners at the borders with Russia, Iran, Georgia, and Turkey. The network is based on DWDM technology, thus the capacity is easily scalable in each direction.¹⁰⁴

Table 8: Backbone operators in Azerbaijan, 2014

Operator	International connectivity	Ownership
Delta Telecom	Operator of Azerbaijani segment of Europe-Persia Express Gateway (EPEC); Gateways with Russia, Georgia, and Iran	Private 100%
Azertelecom	Gateways with Russia, Iran, Georgia, and Turkey	Public 5%, private 95%

Source: Operators' websites, TeleGeography GlobalComms Database, <http://www.telegeography.com>, 2014¹⁰⁵

50. **Duopoly structure of the market raises concerns among national ISPs and creates potential regulatory bottlenecks, which may result in the market failure.** As a way to bolster its telecom infrastructure, the Government of Azerbaijan plans to allocate US\$550mln of public investment for deployment of fiber optic technology in the rural area and selected urban settlements in 2014-2016. By the end of 2016, the government plans to provide broadband access services to 85% of the country's population. The target bandwidth foreseen ranges between 10-30 Mbps for the rural villages and 30-100 Mbps for the urban settlements.¹⁰⁶ To make use of this modern infrastructure Azerbaijan needs to put in place proper regulatory incentives to attract private ISPs and thus receive return on its large investment.

¹⁰² Delta Telecom, 2005-2014, <http://www.delta-telecom.net/> and Interview with Delta Telecom, December 2013.

¹⁰³ See supra note 100.

¹⁰⁴ See supra note 32.

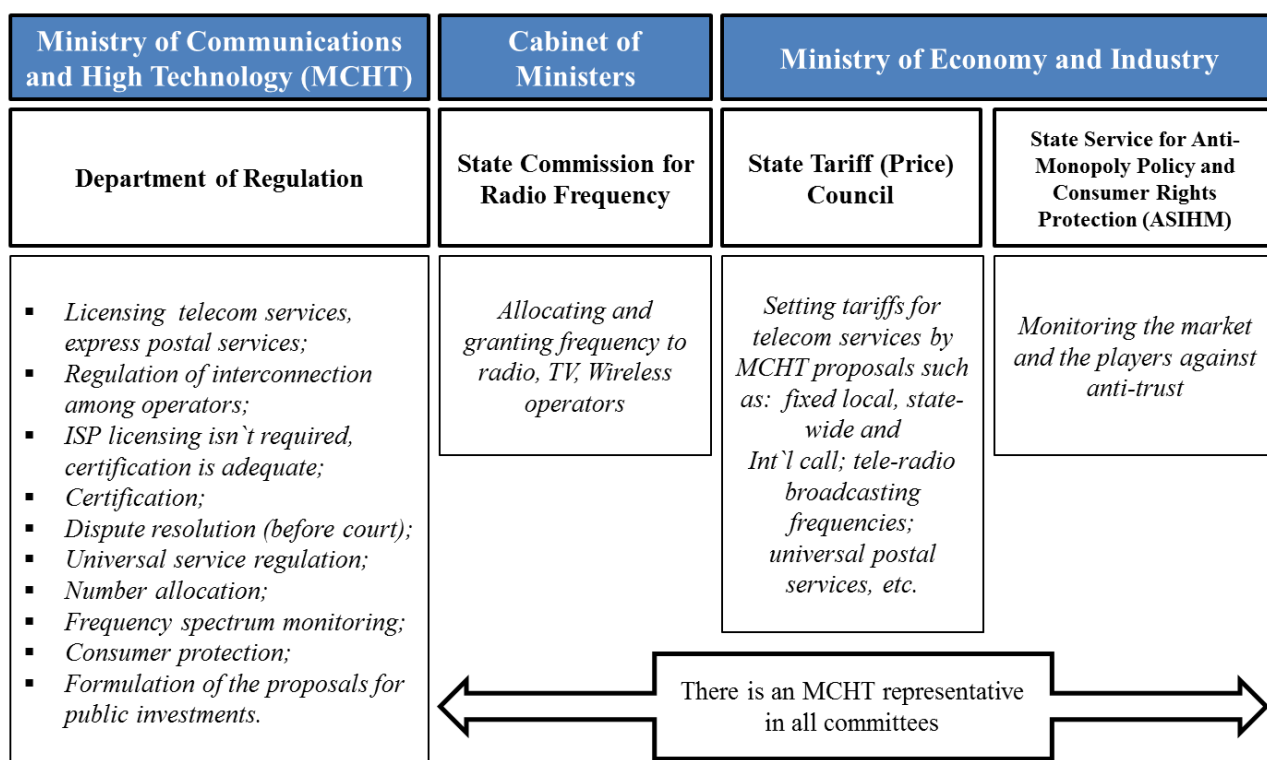
¹⁰⁵ Ibid.

¹⁰⁶ See supra note 54.

IV. Governance Model and Regulatory Framework

51. Azerbaijani State plays the leading role in the overall domestic broadband market development not only through the state-owned telecom companies, but also through governmental institutions such as ministries and committees (Figure 20). Looking at the regulatory environment of Azerbaijan, the first thing one can notice is the lack of an independent sector-specific regulator. The Ministry of Communications and Information Technologies (MCHT), responsible for the formulation and implementation of the state regulation, was created by Presidential Decree 94 of February 2004, replacing the former Ministry of Communications. The latter has just recently been renamed into the Ministry of Communication and High Technologies (MCHT) those structures and mandate have been recently reconsidered and confirmed by a Presidential Decree¹⁰⁷. Regulatory functions related to the spectrum management are performed by the State Commission for Radio Frequencies, which is a subordinate body to the MCHT established under the Cabinet of Ministers. Tariff (Price) Council established under the Ministry of Economy and Industry is responsible for considering and assigning tariffs for telecom services following proposals from MCHT as well as on its own initiative. The function of *ex-post* competition surveillance is performed by State Service for Anti-Monopoly Policy and Consumer Protection (ASIHM) established under the same Ministry. Through its representatives MCHT participates in every stage of the regulatory process.

Figure 20: Distribution of the regulatory functions across different institutions in Azerbaijan



Source: MCHT¹⁰⁸

¹⁰⁷ Decree Nr. 326, 7 March, 2013

¹⁰⁸ MCHT, "Department of Regulations," accessed in April 2014, <http://www.mincom.gov.az/nazirlik-ru-RU/page-419/page-601/>. **Note:** Department of Regulations at MCHT oversees issues relating to development of competition. Specifically, its mandate is to participate in prevention and elimination of the monopoly activity and unjust competition in the telecom and IT sectors.

- 52. MCHT is also actively involved in the coordination of incumbents' activities. The conflict of interests is evident and should therefore be resolved.** In October 2008, the pre-privatization inventory of Aztelekom and BTRIB was finalized and the sale of both telcos was planned by the end of that year. However, the sell-off did not take place and the talks on the matter renewed only in November 2010. In May 2011, MCHT announced a plan according to which the privatization will be preceded by the transformation of both entities from state-owned to joint-stock companies and their subsequent merger, the government retaining 100% of the stocks. In December 2013, MCHT confirmed that the merger would be possibly carried out in 2014.¹⁰⁹
- 53. Not only is MCHT responsible for establishing and enforcing the state policy of electronic communications, but the Ministry also makes proposals on the provision of state financial support to the sector.** The government of Azerbaijan is planning a pilot LTE project that will see high speed mobile broadband expanded to remote areas of the country. The country's two state-owned telecoms operators Aztelekom and BakTelekom were assigned to implement the LTE pilot project. It is expected that implementation will start in the next few months.¹¹⁰ As well, MCHT confirmed its plans to develop a Broadband Strategy addressing market development, and, as part of this plan, the Government plans to allocate up to US\$550 mln from the State Oil Fund of Azerbaijan (SOFAZ) for funding of fiber optics access infrastructure in the regions (FTTH Plan). According to the initial announcements, this project should be launched in 2014 and accompanied by the major regulatory reform. However, few project implementation details are known to date, and a number of details remain obscure: the nature of the business model, amount of forecast return on public investment (or operational model), scope of participation of the private sector, coverage specifics, etc. The infusion of funds will definitely stimulate the fiber market. But the real challenge is to ensure that the state intervention is a proportionate measure which would not crowd out investments from the private sector and which would put in place an efficient and open-access model allowing for the maximized infrastructure usage. The issue then becomes how to boost competition and maximize the benefits from the infrastructure in place for inhabitants of the region. State aid principles adopted by the EU may provide an actionable guidance for Azerbaijan (Box 6).
- 54.** To sum up, the need to address the current governance model cannot be over-emphasized as the Government acts as a policy maker, as a regulator, and as an important market player through the entire value chain of the broadband market. Private sector players and industry associations¹¹¹ have the following expectations of the next steps for the government to take: e.g. establish an independent regulatory body; fully or partially privatize government-owned enterprises or otherwise open them to private investors; proceed with construction of the nationwide fiber optic network with open access for all service providers. International organizations have previously raised concerns regarding the National Regulatory Authorities' lack of independence in some countries, especially when some governments retain considerable voting rights in communications providers.

¹⁰⁹ See supra note 32.

¹¹⁰ Trend News Agency citing Iltimas Mammadov, Deputy Minister of Communications and Information Technologies, as saying that the program will be financed by SOFAZ, May 2014.

¹¹¹ See supra notes 54 and 84.

Box 5: Draft National Broadband Development Plan for Azerbaijan

During the meeting of the Cabinet of Ministers of the Republic of Azerbaijan which discussed the country's socioeconomic development in the first quarter of 2012 President Aliyev defined a set of targets which would make broadband and related services accessible in each settlement of the country. The draft FTTH Plan reflects the targets set by the President while accounting for the opinions of the private sector and non-government entities functioning in the telecom area.

The draft FTTH plan foresees the following modernization of the network: (i) installation of fiber optic cable lines in various directions of the telecommunication network, remote settlements, and telephone boxes that are located in the backbone network at a distance of more than two kilometres from Automatic Telephone Exchange; (ii) modernization of switching and transmission facilities; and (iii) installation of wireline in the un- and underserved residential districts and high rise buildings. Subsidizing coverage with LTE technology for provision of mobile broadband depends on the peculiarities of the geographic locations that need to be provided with broadband connectivity.

Through this project the Government of Azerbaijan will realize a goal of bringing "fiber to each home" through provision of access to a network of fiber-optic high-speed broadband Internet and other advanced telecommunication services. The population living in the metropolitan area of Baku will be provided with broadband Internet with at least 100 Mbps, while other major cities and regional centers – with at least 30 Mbps, and towns and rural areas – with at least 10 Mbps.

Along with infrastructure development, the draft FTTH Plan envisages a set of measures to support telecom reforms and to create a favourable regulatory environment. Among the envisaged reforms are structural reforms which foresee adoption of new legislative acts and regulations, changes to the current tariff policy, and implementation of measures aimed at stimulating end-user demand for broadband services.

MCHT expects that this project will help achieve the following objectives: (i) bridge the "digital gap" in the development of ICT infrastructure in the urban vs. rural areas; (ii) modernize country's telecom networks and infrastructure; (iii) provide ubiquitous access to affordable and high-quality Internet services; (iv) boost the broadband Internet penetration rate to the broadband target of 85%. Simultaneously, this project aims at creating favourable conditions for the use of e-services and expansion of web- and mobile apps in education, health, commerce and other service industries throughout the entire territory of Azerbaijan.

The FTTH Plan will be financed through the State Oil Fund of the Republic of Azerbaijan (SOFAZ) and will be implemented by incumbent operators and other interested ISPs. The project is expected to be implemented in 2014-2016. The initially calculated cost of the project amounts to approximately US\$550 mln.

Establishment of a project management authority for implementation of the FTTH Plan is currently under consideration. The main objective of establishing such an authority is to increase transparency, attain government broadband targets, and effectively manage the FTTH Plan.

The FTTH Plan is projected to be started by end-2014.

Source: Input prepared by MCHT

Box 6: State aid principles: Lessons from the EU

In the area of the state aid application for broadband development the EU seems to have accumulated the widest experience globally while supporting 25 member states over 11 years in their efforts to extend broadband network coverage to the areas where market operators are unlikely to invest on commercial terms.

Through the course of state aid application the EU has developed relevant principles and an overall workable framework. The main principles applicable to the design of any state aid intervention in the EU are summarized below:

- (1) Contribution to the **achievement of objectives of common interest**: State aid should contribute to the achievement of the objectives of common interest, such as goals of national broadband plan;
- (2) **State aid should address** absence of market delivery due to **market failures or important inequalities**: In general, we speak of a “market failure” if a market, left to its own devices, fails to deliver an efficient outcome for society. In the case of broadband, the investments in infrastructure may not be undertaken even though the economic benefits for society (i.e. positive externalities) exceed the cost. It is important to ensure that investment in broadband is also addressing another important objective of common interest – equity (social or regional divide);
- (3) **Appropriateness of State aid as a policy instrument**: State aid intervention is appropriate if there is no alternative to public support to overcome the lack of broadband connectivity, such as *ex-ante* regulation measures, spectrum (re)allocation, and demand side measures.
- (4) Existence of **incentive effect**: State aid should take place only if investment would not have been undertaken within the same time frame without any public intervention. As an example, there may be no infrastructure currently deployed, but mobile operators may have coverage obligations to cover certain geographic area in question (as part of their LTE, LTE-advanced licensing procedures) or certain operator may be designated as universal service provider assisting same area;
- (5) Aid should be **limited to the minimum necessary** and has **limited negative effects**: This set of measures is required to demonstrate that State aid project is proportionate to address connectivity gap. In this regard:
 - a. **detailed mapping and analysis of coverage** should be performed;
 - b. **project should undergo public consultation** to minimize distortions of competition with existing providers and with those who already have investment plans;
 - c. whenever a third-party operator should be selected to deploy and operate subsidized infrastructure, **selection process should be open and transparent**;
 - d. tender should follow **technologically neutral approach** and most economically advantageous (not necessarily the cheapest) offer should be selected;
 - e. State aid **project should take advantage (reuse) to the extent possible from existing infrastructure** (e.g. ducts, masts, etc. also from other sectors like energy);
 - f. subsidized broadband infrastructure **is required to offer effective wholesale access (“open access”) for third parties**;
- (6) The **overall balancing exercise and the compatibility** conditions: Taking into account that public intervention is always the distortion of natural market conditions, **State aid project should be designed in a way that the overall balance of the effects of the project is positive.**

Source: “EU Guidelines for the Application of State Aid Rules in Relation to the Rapid Deployment of Broadband Networks,” European Commission, 2013/C 25/01, <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:C:2013:025:0001:0026:EN:PDF> and “Applications of State Aid rules in relation to rapid deployment of broadband networks”, EFTA Surveillance Authority, 2013, at: <http://www.eftasurv.int/media/state-aid-guidelines/Part-IV---Application-of-state-aid-rules-in-relation-to-rapid-deployment-of-broadband-networks.pdf>

V. Sector Issues and Recommendations

55. Broadband Internet is a powerful enabler for sustainable economic growth, job creation, human skills development, and social transformation. Broadband infrastructure and services contribute directly to countries' productivity, competitiveness, and economic diversification by fostering development of the ICT sector, manufacturing industry, and energy sector. Affordable broadband services and increasing income levels, dynamic mobile broadband market, and government readiness to implement relevant programs in the area of broadband infrastructure development provide Azerbaijan with an opportunity to develop vibrant and competitive broadband market with a remarkable upward growth trajectory.
56. Yet, Azerbaijan is not realizing most of its broadband potential. The competition on the national level, particularly in the segment of fixed broadband market, is currently not viewed as a tool to achieve and sustain market growth and development. Low Internet connection speeds suggest that the high-speed Internet has not yet gained ground in the country while delayed recognition of the importance of competition and sector governance reform continues to withhold efficient broadband market development and investment attraction from the private sector side, including FDIs.
57. Below are the major sector recommendations what would support Azerbaijan's broadband market development and sustainability of its positive growth trajectory in the long term:
- 1) *Ensuring regulatory independence and separation between strategy formulation and implementation* will ensure legal certainty and will attract more investments into the telecom market and new entrants. This subsequently will put the basis for development of service-based followed by infrastructure-based competition benefitting ISPs and customers;
 - 2) *Resolving regulatory bottlenecks at the wholesale level* is necessary for efficient use of existing fixed network infrastructure which will result in increasing broadband penetration at lower costs and within a reasonable time frame as well as increase in the quality of broadband services;
 - 3) *Development of strategy and (or) action plan to promote efficient deployment of the infrastructure by network operators* can tackle the issue of high costs of broadband rollout. Best global experience posits that Azerbaijan can save up to 80-90% of construction costs by utilizing excess fiber capacity owned by energy, road, and railroad infrastructure operators if infrastructure sharing is allowed;
 - 4) *Addressing the low level of infrastructure development in the regions* is critical for ensuring sustainable economic and social development of the entire country. A discrepancy exists between the level of development of Baku and Absheron peninsula and the rest of the country. Broadband rollout can become an important foundation for bringing investments, improved public service delivery, and access to online jobs and marketable skills to the rural areas.